THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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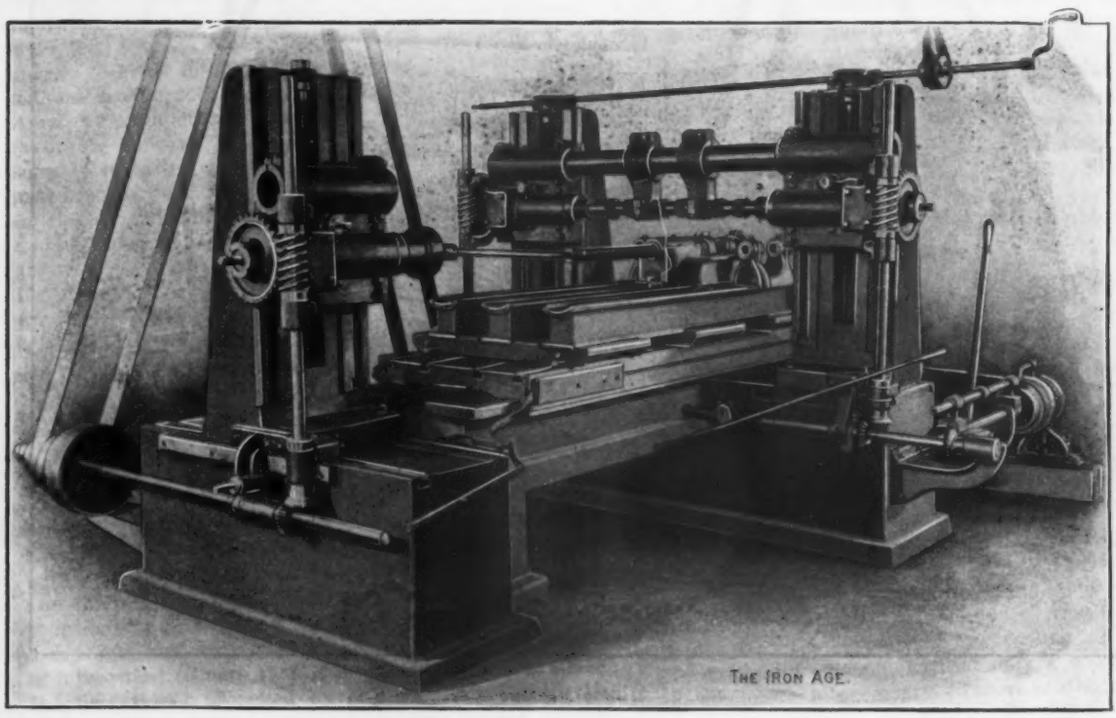
THURSDAY, JUNE 6, 1901.

The Automatic Machine Company's Combined Milling and Boring Machine.

The Automatic Machine Company of Greenfield, Mass., have recently installed in their works a combined milling and boring machine, designed with special reference to the work which they do. The engravings show it set up for milling and boring speed lathes. The lathe beds are first placed upon a jig, as represented in Fig. 2, the machine having a capacity for three 11-inch by 5-foot beds at the same time. These beds are milled on the bottom and on one side, all three at one cut. They are next placed upon another jig, and the ways are milled. The mills are raised and the lathe heads are milled for the caps. They are drilled and tapped by a radial drill not shown in the engraving. The boring jig, Fig. 1, is next placed in position, and the heads are bored for the boxes. In this manner there must be absolute certainty of each lathe being exactly like every other lathe, and consequently all parts will interchange. This method of doing this work is a step in advance of those formerly used. It enables the manufacturers to turn out the work in large quantities, thus reducing the cost, and not only that, but it guarantees the machines to be as near perfect as possible.

The machine is supplied with fast and slow speed in the proportion of 21 to 1, so that the platen may be returned quickly. This fast and slow speed will answer equally well for feeding in either direction. The housings are so constructed as to permit of their being moved in and out, to and from the work, with ease and rapidity. The spindles can be raised or lowered by graduations which read to thousandths of an inch. An electric stop is used on the machine.

In the manufacture of automatic screw machine frames the company use jigs to hold the frame, and the various boring bars, so that the frame once placed in position is practically finished before its removal. The worm driving shafts may be driven either way. The main shaft is driven by a 4-step cone, which admits of a wide range of speed to the tools. The feed is driven by a train of differential gearing consisting of the well known sun and planet train inside a cone case upon which there are three steps. This permits of three changes of feed, either fast or slow.



Boring Bar in Use.

THE AUTOMATIC MACHINE COMPANY'S COMBINED MILLING AND BORING MACHINE.

The Lowry Compress for Baling Scrap Tin and Steel Turnings.

The Planters' Compress Company of Boston, Mass., who have been introducing the Lowry system of baling cotton, have made some interesting and encouraging experiments in baling scrap tin and steel turnings, of which the following is a record:

Scrap tin, as received loose in crates, weighs something under 10 pounds to the cubic foot. In carrying on the experiments the tin was fed to the press by means of a pitchfork, and the capacity of the machine was found to be about 1¼ tons an hour, and the diameter of the bales is 18 inches. The length may be made as desired, anywhere from 6 inches to 3 feet. On a run of about 17,000 pounds, from which 79 bales were made, the average length was 11½ inches per bale, and the average weight about 200 pounds, showing approximately 110 pounds density; but it is perfectly feasible to obtain a density of 150 pounds to the cubic foot, if that is desired. This and other lots of the same class of material have been distributed among consumers, who have spoken in most favorable terms of the results from their point of view, principally on account of the advantage in handling the material at the furnaces, and the saving from loss of material by combustion owing to its being baled so compactly. While most of the material received was in small pieces, it was found during the ex-

periments that flat sheets 12 inches wide and as long as 36 inches could be taken without any trouble. There was also in the lot a number of scrap dishpans 18 inches in diameter and 5 inches deep, which went into the press without difficulty. Some further experiments with the Lowry press are to be made, those carried out to date having been made at an experimental plant where the conditions are not quite as favorable as they would be at a plant where the press and appurtenances were permanently set up for this purpose.

With reference to the baling of steel turnings, exhaustive tests have also been made, as a result of which it has been found, first, that these loose turnings, as received, weigh about 14 pounds to the cubic foot. The average density of this same material, after it has been subjected to the Lowry process, is about 156 pounds to the cubic foot. The material can best be fed to the press on some form of carrier, which will deliver to the head of the press a constant supply, the capacity of the machine on this material being a little under 1 ton an hour.

It should be borne in mind, however, in this connection that here again the experiments were carried on in the experimental plant, and the convenience therefore for handling the material did not probably give as good results in capacity as would be the case if the plant were set up for permanent operation. The bales made were approximately 16 inches in length and 18 inches in diameter, but, as in the case of the tin bales, the length can be varied anywhere from 6 inches to 3 feet, according to the weight desired in a bale, the diameter being a constant of 18 inches. It was also found that from each 4 tons of the loose turnings there was extracted about 1 ton of oil, water, &c. Therefore, that the capacity above referred to is 25 per cent. higher, if figuring on the turnings as received.

Among the advantages which are found from having steel turnings packed in Lowry bales are, first, the possibility of stowing a much larger quantity in a given space than is possible with the loose turnings. They can also be much more easily handled in this compact form, while the exclusion of such a large percentage of water and oil saves the heat which would be required for the evaporating process. In addition to the above, oxidation of the material, after it is baled, is practically impossible, and on account of the increased amount which can be stored in a given space, a given quantity of the material can be put into the furnace with a much less loss of heat and time than would be required in handling loose turnings. Of course there would also be a saving in the number of charging boxes required for the purpose of handling it.

The Brown-Corliss Engine Company.

The contracts for the building of the main buildings for the Brown-Corliss Engine Company, at the newly laid out manufacturing town of Corliss, Wis., have been let to the American Bridge Company, who agree to have the work completed within four months. These buildings will consist of a machine shop 120 x 500 feet, a foundry 350 x 115 feet, and buildings for boiler rooms, engine room, forge shop, pattern storage, pattern shop and a completely equipped electric plant. Some of these smaller buildings are not included in the contracts, but will be contracted for later. The buildings are to be furnished with the latest facilities for handling the large Corliss engines that are to be manufactured, and electric cranes will be placed between the two main shops and along the entire length of the buildings. The total cost of the plant is estimated at $350,000, and it is expected that it will be ready for operation early in September.

The company, who are incorporated for $1,000,000, have 1200 acres of cultivated land at Western Union Junction, with a gradual incline to the water frontage. Already many manufacturers are recognizing the advantages of this town, and it is assured that at least half a dozen concerns will be located there inside of six months. The Brown-Corliss Engine Company have platted the property and will erect commodious dwelling houses for their employees, as well as lighting the town by electric light. Offices have been opened in Milwaukee in the Matthews Building.

The officers are: President, Julius Wechselberg of Milwaukee; vice-president and treasurer, Walter S. Whiting, a son of S. B. Whiting, general manager of the Calumet & Hecla Mining Company, and now in charge of the Oak Iron Works, Chesterfield, England; second vice-president and general manager, Walter F. Brown, who has been connected with the engine business for 25 years, and secretary, Edward L. Keane.

The subscribers to the capital stock include some

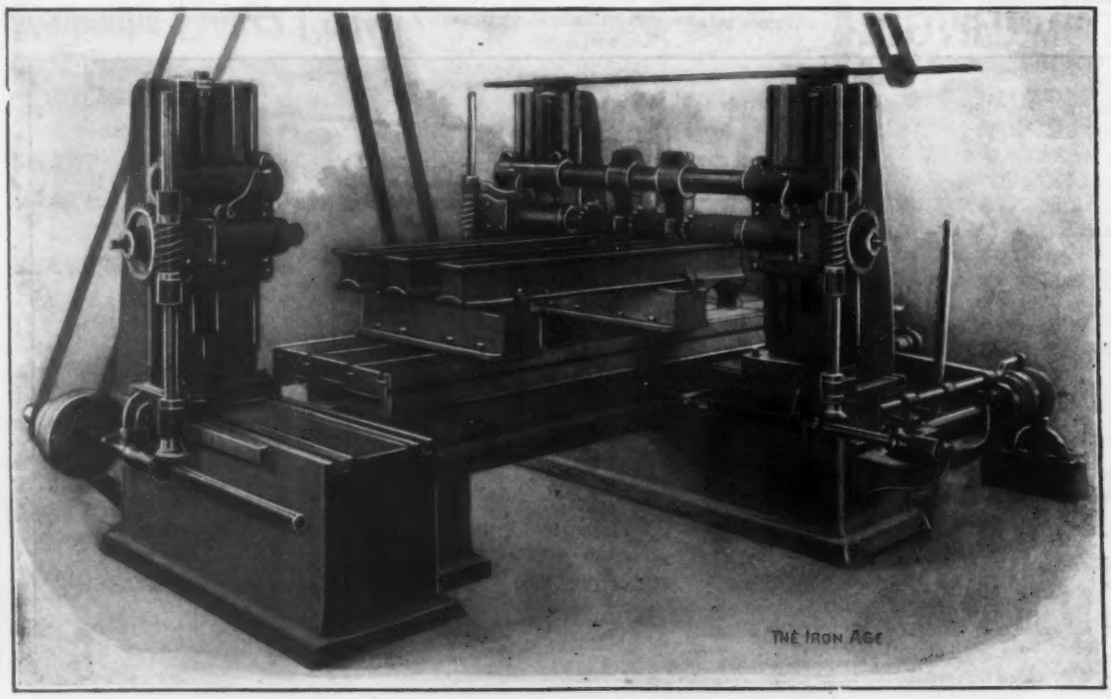


Fig. 2.—Milling Machine Beds.

THE AUTOMATIC MACHINE COMPANY'S COMBINED MILLING AND BORING MACHINE.

well-known and influential business men of London, England; Boston, Mass.; Providence, R. I.; Philadelphia, the anthracite coal regions of Pennsylvania and the iron and copper regions of Michigan, and the city of Milwaukee.

Trade in Scotland.

The Iron Trade.

GLASGOW, May 24, 1901.—The situation as regards iron and steel has developed no new feature. The incident of Victoria Day and the Whitsuntide holidays have kept the markets in a quiet condition, although they do not affect production. It is in July that the working classes of Scotland take their play week—or fortnight, as the case may be. A few more blast furnaces have been lighted, but there are still some half dozen fewer in blast than at this time last year. The foreign orders for pigs show no tendency to increase—rather the reverse—but that is not surprising, considering how much relatively cheaper Cleveland iron is than Scotch just now. Consumers are only buying for present needs, not seeing in prices of either crude or finished material and inducement to buy ahead. Steel is dull all around. As a few more contracts for ships have been placed of late, there has been a little more buying of ship plates, but at a good deal under £6. The price in the North of England is £5 15s., less 2½ per cent., which does not allow of a margin to bring to Scotland, but which prevents Scotch makers from quoting higher, even in the absence of American competition. The trade here has not been favorably improved by recent American advices, which seem to indicate that the turn of the tide on your side may soon be expected. The trouble with the machinists in the United States is being watched with the utmost interest here, because some of the points at issue are so closely analagous to those in our great engineering fight of 1897-98. On that occasion the Federated Engineering Employers held firm to a man and won the day, to the lasting benefit of the whole trade.

A Turbine Passenger Boat.

Great interest attaches to a turbine passenger steamer which is to commence service on the Clyde next month. She has been built by Messrs. Wm. Denny & Brothers, Dumbarton (the builders, by the way, of "Shamrock II"), and is engined by the Parsons Marine Steam Turbine Company, with one high pressure and two low pressure turbines. The boat has five propellers, with which she is expected to make a speed of 20 knots, and she is the first merchant or passenger steamer to be propelled by turbines. Whether she is to be the first of a new and numerous race we shall presently see, but it is interesting to note that it is exactly 100 years since the first vessel propelled by steam was put into the water at Glasgow. In the shipbuilding section at the International Exhibition here the grades of transition during these hundred years are very strikingly exhibited. Among examples of the latest developments of the century are the twin screw sisters, "Zeeland" and "Vaterland," built by John Brown & Co., Limited, last year for the International Navigation Company, for whom the same firm have this year launched the "Haverford" and are building the "Merion," characteristic examples of the latest type of Atlantic carriers.

Boiler Feeding Appliances.

The Water Tube Boiler Committee have been recently in Glasgow, for the purpose of witnessing some experiments by James Weir on the subject of corrosion or pitting owing to the presence of air in solution in the feed water, which has been particularly harmful in the case of the Belleville boiler. In evidence before the committee Mr. Weir contended that in merchant practice the use of the feed water heater had the effect of liberating and removing the dissolved oxygen before the passage of the feed water into the boiler. The object of the experiments has to demonstrate this.

This incident lends special interest to the various specialties and novelties in auxiliary machinery displayed by G. and J. Weir, Limited, in the Machinery Hall at the Exhibition here. This particular exhibit will appeal direct to Americans because it illustrates one of the most striking examples we have in this country of the modern tendency in engineering toward specialization. Mr. Weir and his firm have devoted all their attention for years past to matters relative to boiler feeding, and by industry, ingenuity and incessant experiment they have developed a perfection of gear that even Americans may admire, especially as their organization and system are based on the best American methods, and their machine tools are of the latest American type.

A novelty here displayed is a compound feed pump which is in two styles—twin compound, being two pumps with high pressure and low pressure cylinders, and tandem compound, with one pump with high pressure and one with low pressure cylinders. The Weir feed pump for stationary requirements is a development of their well-known marine feed pump. It meets the demand for a better class of pump than has been hitherto on the market—a demand which has resulted from the greater attention now paid to the auxiliaries in the engine and boiler room, and from the experience that it is false economy to have fast running cheaply got up feed pumps. In this pump the valve gear is positive—the steam valve can never be in such a position that the pump will not start immediately that steam is turned on. The only possible way in which the main valve can rest is at full travel either for an up or down stroke of the piston, and the valve arangement insures constant length of stroke and certainty of action. The steam valve is simple enough—merely a D slide valve with a small auxiliary valve working on the back. As these are the only two moving parts proper in the steam chest there is little opportunity for wear, and there are no delicate adjustments to get out of order. The steam is used expansively, and the cut-off can be regulated from the outside while the pump is working. It is claimed that this is the most economical pump in steam consumption in the market.

Another novelty introduced by this firm is the Weir patent evaporator, called for by the necessity now recognized of having absolutely pure water for the feed make up, especially where water tube boilers are employed. The Admiralty type of the new and improved vertical evaporator embodies the result of Mr. Weir's long experience. It combines with high evaporative efficiency the simplest and most convenient arrangement for cleaning and overhauling. The shell of the Admiralty evaporator is constructed entirely of gun metal, which insures complete immunity from corrosion, which is such a source of trouble in evaporators with steel shells. Messrs. Weir also manufacture a special type of distributing condenser for naval purposes, the feature of which is that the condensing and cooling surfaces are made uniformly efficient, so that only a comparatively small condenser is necessary. The requisite pumps are separate or combined according to the size and requirements of the plant, and are of the direct acting type.

This exhibit is mentioned here because while it is one of the most striking features in the Machinery Hall (being grouped behind a picturesque cascade of water), it has a special interest in connection with the great boiler question which is now occupying so much attention on both sides of the Atlantic. B. T.

The Taylor Tin Plate Plant.—The new tin plate plant at Cumberland, Md., of the N. & G. Taylor Company, Philadelphia, which has been in course of construction for the past four months, has been started with a full force in all its departments. The building is constructed wholly of iron and steel, and covered with iron sheeting, making it entirely fire proof. The new plant consists at present of two stands of hot mills and two cold roll mills complete, pickling plant and all necessary machinery, and with all possible improvements up to date. There are two doubling and two heating furnaces, and two double annealing furnaces of modern construction. When in full operation 200 men will be employed. Arrangements have been made in the new plant for the establishment at any time of two more hot mills and one more cold roll mill.

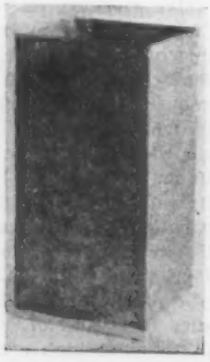
The Edison Storage Battery.*

BY DR. A. E. KENNELLY.

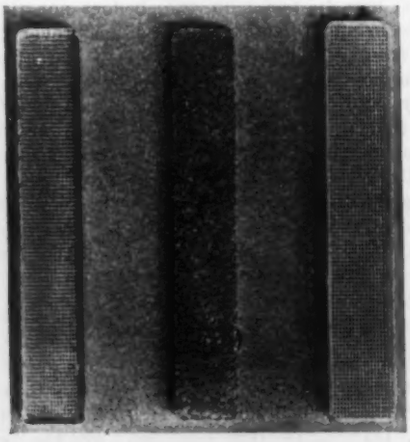
It is well known that the history of the storage cell is essentially that of the lead cell discovered by Planté in 1860, in which lead peroxide is the depolarizing substance. An enormous amount of labor has, in the aggregate, been expended upon the improvement of this cell in the hands of experimentalists. As a result of that labor, the storage battery has at last become a recognized adjunct to direct current central stations, but it has limitations that seem to withstand further attempts toward improvement. Of recent years, hardly any success has been met with in the direction of reducing its weight for a given energy storage capacity, without detriment to endurance, and this weight is the great drawback of the storage battery in electric storage traction, and has been the principal obstacle to its advance in this direction for the past 20 years.

In practice, the storage energy per unit mass of the modern lead battery is from 4 to 6 watt-hours per pound of battery (8.8 to 13.23 watt-hours per kilogram). Expressed in another way, a battery weighs from 124.5 to 186.5 pounds per horse-power-hour at its terminals (75.5 to 113.4 kg. per kilowatt-hour); or, if its stored energy available at terminals were all expended in gravitational work, a battery could raise its own weight through a vertical distance of from 2 to 3 miles (3.2 to 4.8 km.).

While it is possible to increase the energy per unit mass by making the electrodes very light, yet this is always found to be followed by a very heavy deterioration.



Type of Metallic Cell Used with the Battery.



Type of Plate.

THE EDISON STORAGE BATTERY.

Objects Sought.

Mr. Edison set himself the task of finding a cell which should possess the following advantages:

1. Absence of deterioration by work.
2. Large storage capacity per unit of mass.
3. Capability of being rapidly charged and discharged.
4. Capability of withstanding careless treatment.
5. Inexpensiveness.

He believes that the cell here shown may claim these advantages in a very satisfactory degree.

Elements of Battery.

The negative pole or positive element, corresponding to the zinc of a primary cell or the spongy lead of a secondary cell, is iron. The positive pole or negative element, corresponding to the carbon of a primary cell or lead peroxide of a secondary cell, is a superoxide of nickel believed to have the formula NiO_2. The cell is therefore a nickel-iron cell, a name which suggests the structural material nickel steel. The electrolyte is potash—viz., an aqueous solution containing from 10 to 40 per cent. by weight, but preferably 20 per cent., of potassium hydroxide, the freezing temperature of which is 20 degrees below zero F., or 30 degrees C.

Capacity.

The initial voltage of discharge after recent charge is 1.5 volts. The mean voltage of full discharge is approximately 1.1 volts. The normal discharging current rate per unit of active element (positive or negative) is 60 $\frac{\text{milliamperes}}{\text{square inch.}}$ or 8.64 $\frac{\text{amperes}}{\text{square foot}}$ or 0.93 $\frac{\text{amperes}}{\text{square decimeter}}$. The storage capacity of the cell per unit of total mass of the cell is 14 watt-hours per pounds of 30.85 watt-hours per kg. Expressing the same statement in another way, the weight of battery per unit of electric energy at terminals is 53.3 pounds per electrical horse-power-hour or 32.4 kg. per kilowatt-hour. Or the battery gives energy at its terminals sufficient to lift its own weight through a vertical distance of approximately 7 miles, or 11.26 km. The mean normal discharging power rate per unit mass of total cell is 4 watts per pound, or 8.82 watts per kg., corresponding to a normal discharge period of 3½ hours. The cell may, however, be discharged at a relatively high rate, in approximately one hour, corresponding to a discharging power rate per unit of total cell mass of 12 watts per pound or 26.46 watts per kg. Charging and discharging rates are alike. That is to say, the cell may be charged at the normal rate in 3½ hours, or it may be charged at a relatively high rate in 1 hour, with no apparent detriment beyond a somewhat lowered electrical charge efficiency. In other words, the cell does not appear to be injured by overcharging or discharging, and only suffers in electrical efficiency under such treatment.

Construction of Plates.

The positive and negative plates are mechanically alike, and can scarcely be distinguished by the eye. They differ only in the chemical contents of their pockets. Each plate is formed of a comparatively thin sheet of steel, 0.024 inch (0.61 mm.) in thickness, out of which rectangular holes are stamped, so as to leave a grid or frame somewhat resembling a window frame. In the plate here shown there are three rows of eight such rectangular holes or recesses, or 24 recesses in all.

Each opening or recess is filled with a pocket or shallow box containing the active material. These boxes correspond to the panes of glass in the window frame analogy. The panes, instead of being thinner than the frame, as in an actual window, are thicker than the frame, or project slightly beyond the surface of the steel grid. They are perforated with numerous small holes to admit the electrolyte, but entirely conceal the contained active material from view. All that meets the eye, there-

* Abstract of paper read at the annual meeting of the American Institute of Electrical Engineers.

fore, in any of the plates is the steel frame and its imbedded "windows" of perforated steel.

The active material is made in the form of rectangular cakes or briquettes, and one such briquette is lodged in each pocket or "window pane" of the plate. Each of the plates shown, therefore, supports, or contains, 24 briquettes of active material, all in rigid contact with its own substance.

Each briquette is placed in a shallow, closely fitting nickel plated box of thin perforated crucible steel, cut from a long strip of that material 0.003 inch (0.075 mm.) thick. A cover or lid of the same material is then laid over it, so that the briquette is closely enveloped by the sides and walls of its perforated steel box. The boxes are then placed in the openings or holes in the nickel plated steel grid, and closely fit the same. The assembled plate is then placed in a hydraulic press and subjected to a total pressure of about 100 tons. This pressure not only tightly closes the boxes, but it also forces their metal sides over the adjacent sides of the recesses in the steel grid, thus clamping the whole mass into a single solid and rigid steel plate with the hollow "window panes" full of active material. The nickel plating of both grids and boxes aids in securing good permanent electric connections between them. The finished plate has a grid thickness of 0.024 inch (0.56 mm.) and a window or pocket thickness of 0.1 inch (2.5 mm.). This is the maximum thickness of the plate at any point, but being of steel the plate has ample rigidity.

The positive briquettes (zincs of a primary cell) are made by mixing a finely divided compound of iron obtained by a special chemical process with a nearly equal volume of thin flakes of graphite. The graphite does not enter into any of the chemical actions, but assists the conductivity of the briquettes. The graphite is divided into very thin laminæ by a chemical process, and these are passed through sieves or screens so as to leave a size or area of flake that is much larger than the area of the perforation in the steel windows. The mixture is then pressed into briquettes in a mold, under a hydraulic pressure of about 2 tons per square inch. The briquettes have a surface area of nearly 3 inches by ½ inch on each face.

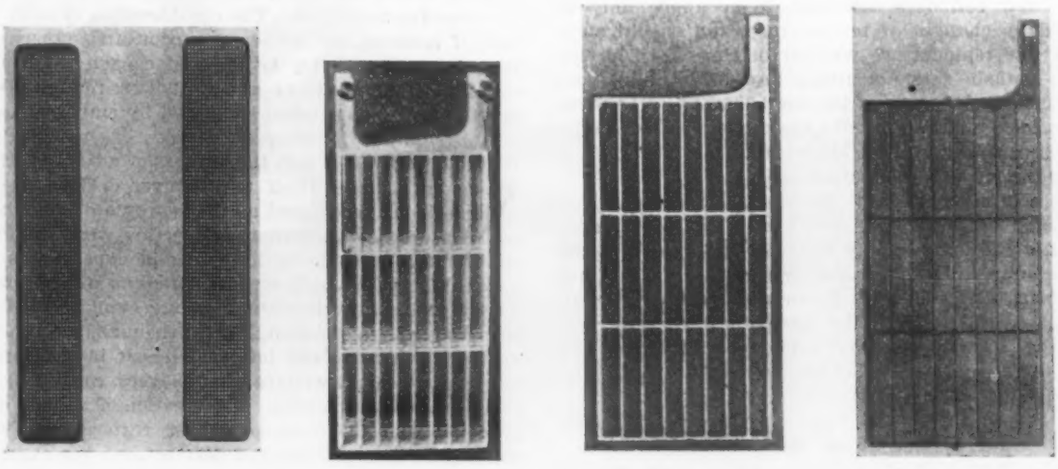
The negative briquette (carbon of a primary cell) is made by similarly mixing a finely divided compound of nickel, obtained by special chemical means, with a nearly equal bulk of fine flakes of graphite and solidifying the mixture in a mold into briquettes of the same size as above.

A suitable number of positive and negative plates are assembled together, being separated from one another only by a thin sheet of perforated hard rubber.

The assembled plates are placed in a vessel or external containing cell of sheet steel containing the potash solution, which, of course, does not attack steel. There was, however, much difficulty from the action of the potash on the soldered seams of the steel containing vessel. After many trials, however, Mr. Edison found a solder which seems to be entirely unaffected by the alkali.

Chemical Action.

In charging the current is, of course, sent into the positive pole and its attached negative nickel plate through the electrolyte, and into the positive plate of the iron compound which carries the negative pole. This current deoxidizes or reduces the compound to a spongy metallic iron and carries the oxygen through the film of electrolyte to the nickel compound, oxidizing it to the hyperoxide of nickel, NiO_2, a higher oxide than the peroxide. In other words, the charging current simply carries oxygen in the opposite direction against the forces of chemical affinity, from the iron to the nickel, and stores the energy in the reduced iron, which is, of course, unaffected and passive in the presence of the potash solution. On discharge the current passes from the positive pole through the external circuit to the negative pole, and its attached iron or positive plate, and then through the solution to the negative or superoxide plate. In so doing the oxygen moves back against the current and partially reduces the nickel superoxide NiO_2 while oxidizing the spongy iron. The energy of burning of the iron and oxygen which would be developed as heat in the ordinary chemical process is now liberated in the circuit as electrical energy.



Briquettes and Plates Used in Battery.

THE EDISON STORAGE BATTERY.

The cell is an oxygen lift. Charging pulls the oxygen away from the iron and delivers it temporarily to the nickel. The condition is then stable until the circuit of the cell is completed. Discharge then allows the oxygen to fall back from the nickel to the iron with the natural affinity of iron and oxygen.

In the new Edison cell the theoretical action of the potash solution is merely to provide the proper channel through which the oxygen ions may travel in one direction or the other—positive plate to negative plate in charge, and negative plate to positive plate in discharge. Consequently the amount of solution needs only to be sufficient to fulfill mechanical requirements. It is believed that the weight of solution will in practice be only about 20 per cent. of the plate weight, or about 14 per cent. of the cell weight. In fact, the cell may be worked in the same manner as the so-called primary "dry cells." Moreover, if the solution should escape, or be carried away, by gasing in charging, the only detriment seems to be the loss of active surface thereby occasioned, and it will only be necessary to fill up the cells to the proper level with water from time to time as evaporation or gasing may lower the level. For the same reason the specific gravity of the electrolyte does not appreciably vary during charge and discharge.

The briquettes of active material slightly expand on receiving oxygen, and slightly contract on delivering it—that is to say, the iron briquettes contract and the nickel briquettes expand during charge, while on discharge the iron briquettes expand and the nickel briquettes contract. The level of the solution is in this way scarcely affected. The expansions and contractions of the briquettes appear to be well within the elastic limits of the spring steel containing boxes, and consequently the electric contact is always secure. The covers or sides of the window pockets merely approach to or recede from each other slightly during charge and discharge. Fortunately, steel is a metal which possesses this mechanical elasticity in a marked degree.

The action of the charging and discharging current upon the briquettes seems to be transferred from their external surfaces inward in a manner similar to the transfer of carbon and oxygen in the process of making malleable cast iron in the furnace on the principle of cementation. No active material has been found to be ejected from the briquettes through the window perforations, even under deliberate overcharging and discharging. Such gas as is thereby produced makes its appearance on the external surface of the windows.

Advantages.

The new cell does not seem to be appreciably influenced by changes of temperature, and should stand a very low temperature without detriment. The electrolyte—potash—does not attack any of the ingredients of the cell, nor are any of the ingredients soluble therein. No local action occurs in the cell so far as has yet been observed, since the electromotive force is below that necessary to decompose water.

The cell may be fully discharged to the practical zero point of electromotive force without detriment. In fact, a cell has not only been completely discharged, but recharged in the reverse or wrong direction, and after bringing it back to its originally charged state by proper restoration of the direction of charging current, the storage capacity remained unaffected. It would seem, therefore, that the cell should be capable of withstanding much abuse.

Mr. Edison states that "the negative plate (nickel), either charged or discharged, can be removed from a working cell and dried in the air for a week without appreciably injuring it, and when the plate is finally replaced in the cell its charge is practically undiminished."

The positive (iron) plate, if similarly removed from the cell, will be likewise uninjured, but it soon loses its charge by the oxidization of the spongy iron with accompanying liberation of heat and appreciable rise of temperature extending over a period of several hours. On replacing the electrode, however, in the cell the storage capacity is unaffected on recharge.

As regards cost, Mr. Edison believes that after factory facilities now in course of preparation have been completed he will be able to furnish the cells at a price per kilowatt-hour not greater than the prevailing price of lead cells.

J. W. Walker, formerly general manager of the Pittsburgh district for the American Bridge Company, with Mr. Mackenzie, Mr. Connolly, Mr. Mitchell, and Henry W. Werneberg, a contractor, has formed the Pittsburgh Construction Company, with $100,000 capital, the intention being to do a general construction and contracting business. The company will buy material from the American Bridge Company, and simply do the erecting. They will take all kinds of contracts. They have already contracted to build 13 miles of an extension for the West Side Belt Line at a cost of $400,000. This contract is to be completed by next January. About 500,000 yards of material will have to be moved, a great number of small masonry and trestle bridges will be constructed, and one cut of 65 feet will be made. The line will open new coal fields, and will connect the Pittsburgh & Lake Erie Railroad with the Baltimore & Ohio Railroad at Curry Station.

Conference on Welfare of Employees.

F. N. Savage, president of the Steel Works Club of Joliet, Ill., who has called a national conference of firms and corporations to discuss the welfare of employees, has issued the following statement explanatory of the movement:

There are a number of firms and corporations that have institutions and activities through which they are struggling to improve the economic, moral and social conditions of their employees, and there are a good many persons interested in the work. The object of the conference, which has been called to meet at Buffalo on June 24, is, I think, to bring together these people, exchange ideas, effect a permanent organization and ascertain, as far as possible, what can and should be done toward the end in view—viz., the betterment of the wage earner. I assume that the conference will not take up the question of wages, nor do I think it should discuss the labor unions. I also think that should we attempt to interfere with either question our usefulness would be impaired.

There have been a number of efforts made toward the general uplift, in the way of encouraging men to own their homes and beautify them and the establishment of clubs, containing libraries, reading rooms, gymnasiums, billiard rooms and with educational opportunities and facilities for recreation. The consideration of such work and, if feasible, its further extension and efforts along that line will probably be the first consideration of the conference. Institutions and activities for the betterment of employees, when supported by employers, carry with them an increased degree of responsibility. Whether you will or not, the impress of authority and indorsement attaches itself to whatever is done by each, and one being recognized as the representative of a corporation or one's immediate connection with it prevents our humoring people by indulging in experiments with untried theories which are calculated to disorganize industry and create discontent among employees. It has been and is yet a question how far the manager of a large firm or corporation can interest himself in the personal affairs and general welfare of employees, consistent with sound business principles. The creation of a spirit of dependence and the development of fraternalism would not only be demoralizing but destructive. We cannot be guided by efforts made in Europe in behalf of the wage earner, as the fraternal idea has generally prevailed there. Any way, the heads of large business enterprises have not the time to give personal attention to the general welfare of the great body of employees, even if their doing so were not calculated to create complications; therefore, efforts in their behalf, I think, must necessarily be delegated to others.

A New Use for Pneumatic Tools.—One of the latest uses to which pneumatic tools have been applied is chiseling and gouging by means of properly formed tools, used in connection with the pneumatic hammer. The hammer strikes a series of very rapid blows upon the end of the chisel inserted in the hammer, and the chisel is thereby driven rapidly into the block or timber designed to be mortised or otherwise treated. The work is done much more rapidly and with greater ease to the operator than by hand, when using a mallet and hand chisel. The Standard Pneumatic Tool Company, Marquette Building, Chicago, are finding a growing trade in their chiseling hammers designed for this purpose.

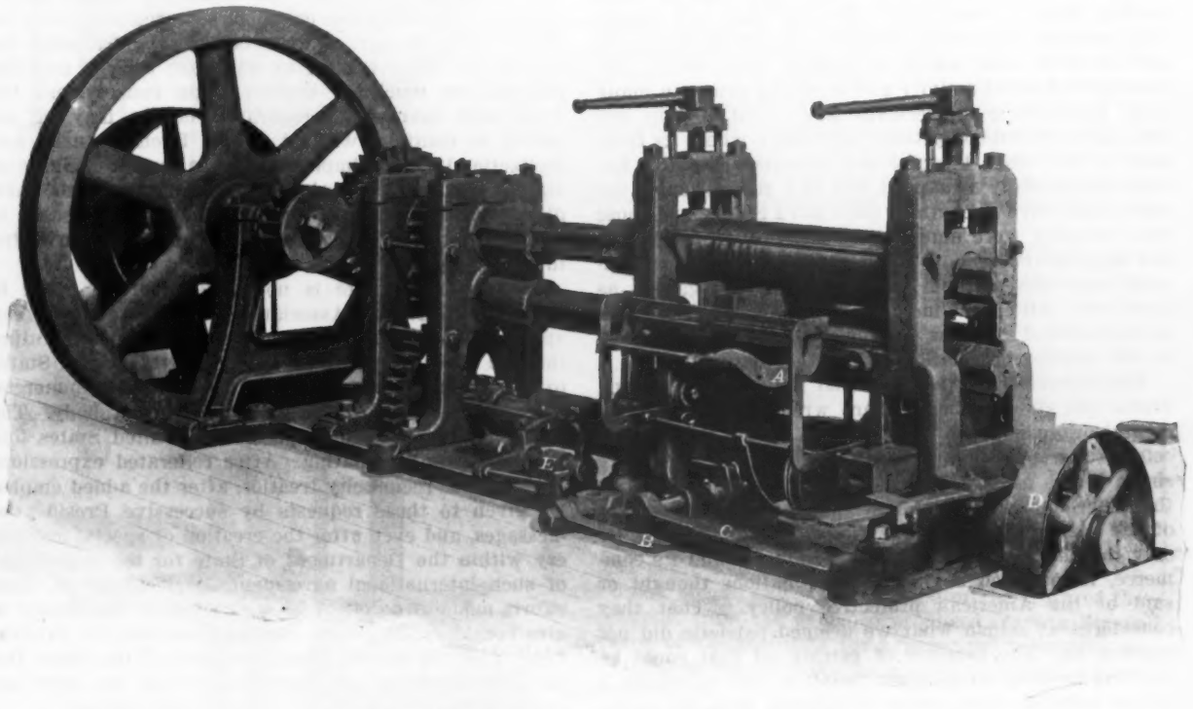
The Pittsburgh Steamship Company, under whose organization all the fleets belonging to the United States Steel Corporation are assembled, have established their offices in the Board of Trade Building at Duluth, Minn. General Manager A. B. Wolvin and Assistant Manager A. L. Harvey will make their headquarters there. Captain Wolvin expects that the company's ships will carry about 10,000,000 tons this year, and there have been contracted from Pickands, Mather & Co. and other outside parties sufficient boats to move about 2,500,000 tons more.

The Birmingham Scythe Rolling Machine.

The scythe rolling machine here illustrated, built by the Birmingham Iron Foundry of Derby, Conn., represents the latest development of the original machine designed several years ago by J. H. C. Bacheldor. This company have built practically all of the scythe rolling machines used in the United States since their first introduction, about 1870, and the last one was constructed from entirely new designs and new patterns.

The chief advantage of these machines, although they effect a great saving in labor, is the fact that they do much more perfect work—namely, they produce scythes of uniform weight to the length of the blade and of a true taper from heel to point. The rolling mill shown in the illustration is not necessarily confined to scythe rolling, as it can be adapted to any metal that is to be rolled on a taper by taking into account the speed of the roll surface and the travel of the slides, and obtaining any desired proportion by the change of gears.

To describe the operation of this mill we will designate the handle, which is seen in front of the lower roll in the photograph, as A, the treadle on the front and bottom of the mill as B, the treadle directly back of B as C, the pulley at the end of the mill as D, and the dog between the pinion and the roll housings as E.



THE BIRMINGHAM SCYTHE ROLLING MACHINE.

First, the self acting tongs are drawn back full length, the rod passed through the jaws of the tongs into the guide boxes, close to the roll. The lever A is then pressed down, and the treadle B depressed and held down. This action brings the dog E in front of the slide. The treadle C is then pressed down, which will bring the clutch into gear, and at the same time the tongs will be advanced by means of the cam on the shaft and a latch attached to the tongs, and will enter the rod into the rolls. As the slide advances the end comes into contact with the dog E, which unships the clutch and leaves the slides in the right position for the next operation. This operation is to draw the tongs back as at first, pass the rod between the jaws (flatways this time), and then press down on treadle C, and the tongs will act. The rod will pass through the roll slides, raising the bottom roll and giving the rod a true taper from heel to point. Four passes, two edgeways and two flatways, complete the operation. The slides are then returned to place by means of the pulley D and clutch at the end of the machine. The slides are made sectionally, so that any desired amount of taper can be obtained by putting wedges of proper thickness between the sections.

Oil Superseding Coal in Texas.

A press dispatch from Beaumont, Texas, says that nearly every interest formerly using coal in that section of the country is now preparing to adopt oil for fuel, and it is expected that in less than six months the whole southwestern portion of the country will be using oil in place of coal. The Atchison, Topeka & Santa Fé Railroad system, the Kansas City Southern system, the Southern Pacific and several other lines are equipping their locomotives with oil burners, and will give the oil fuel a practical test. As the Santa Fé has already experimented successfully with the liquid fuel on their California line, it is expected that the replacement of coal by oil is likely to be made general in Texas within a short time. The J. M. Guffey Petroleum Company of Beaumont have purchased two whaleback boats at Cleveland, Ohio, by which they propose to deliver oil at all lake points. The company have already two pipe lines from their wells at Beaumont to Port Arthur and up the Sabine Pass. The pipe lines have a carrying capacity of 20,000 barrels of oil a day, and the oil can thus be delivered direct from the wells to steamers at Sabine Pass. It is estimated that for fuel purposes three and one-half barrels of oil are equal to 1 ton of the best Pittsburgh coal. On this basis the oil can come into competition with Pittsburgh coal at lake ports and other territory where coal is worth over $2.50 a ton. It is thought possible to load tank steamers at Port Arthur, Texas, send them around by the gulf, the Atlantic Ocean, the St. Lawrence River and the Welland Canal into the chain of great lakes and deliver the oil in less than 30 days.

The directors of the Wisconsin Graphite Company of Stevens Point, Wis., are about to erect a $50,000 plant in or near Pittsburgh. The graphite deposits belonging to the concern are located at Stevens Point, and it is their intention to ship the ore to the new Pittsburgh plant when completed, where it will be crushed and separated and prepared for the market. The officers of the Wisconsin Graphite Company, as recently reorganized, are: E. D. Steinman, president; Howard B. Swearer, vice-president and general manager; W. W. Pipes, secretary, and Frederick J. Shaler, general sales agent, who, with H. M. Bradley, form the directorate of the company.

An oil gusher of large proportions is reported to have been struck 15 miles southeast of Houma, La., and 40 miles west of New Orleans.

Commercial Reciprocity.*

BY THOMAS C. SEARCH.

The most serious problem that now presents itself in relation to the export trade of the United States concerns not only the further extension of this trade, but also the preservation of the business already established. Heretofore it has been comparatively easy for American manufacturers to secure foreign business whenever they have put forth serious effort to get it. Emergencies of unusual activity in England and Germany, which have debarred manufacturers in those countries from aggressive competition, have made it possible in many instances for American manufacturers to secure with little effort orders which under ordinary conditions could have been taken only by a struggle. Then, again, American competition has not been regarded abroad as a very important factor in international trade by those who have encountered it.

These conditions have changed very materially during the past year, and will be altered still further in the near future. Instead of a free field and open markets we are likely to encounter obstacles that will hinder very seriously the further extension of our foreign trade and threaten that which is already established. Decreasing industrial activity and declining prices in many lines, particularly in Germany and Great Britain, are making American competition oppressive where its force was not felt when business was abundant for all. Europe has suddenly awakened, too, to a realization of the vast competitive strength of the United States, and those who formerly were amused and entertained by American aggressiveness now are alarmed by our encroachment upon the markets which they have regarded as their own. All of this indicates that new conditions will be encountered and new problems will have to be solved in our commercial relations with other nations.

The expansion of the territorial limits of the United States has given rather a sharp wrench to our governmental organism, and the extension of the field of our commercial operations is likely to give a no less severe shock to the economic policy which has made possible the marvelous industrial and commercial development of the nation. So long as it was necessary to consider only the needs of the country, its industry and its commerce, it mattered not what other nations thought or said of the American protective policy. That they considered as selfish what we deemed patriotic did not concern us. The practice of getting all that could be had and keeping all that was obtained was eminently a proper principle upon which to proceed with the development of the nation's industries within the limits of the domestic market.

Having crossed the seas with goods to sell, and having begun a business that has amazed foreign competitors, we are confronted with new conditions, and we find that the outer view of our economic policy differs somewhat from its appearance on this side. A century of history has demonstrated the marvelous efficiency of the protective policy for the creation of a great and prosperous industrial nation. Other nations, profiting by our experience, adopt the same policy, and barriers rise to impede our commercial progress abroad.

What shall we do under these conditions to preserve our export trade and open the way for its further expansion? Shall we abandon our protective system and ask other nations to give us equally free admission to their markets? Not for a moment should we consider such a step. It would be neither safe, expedient nor practical in accomplishing the desired purpose. If Germany seeks industrial advancement through a protective policy, far be it from us to object to the fullest enjoyment by others of that which has given us so great prosperity. If Russia undertakes to plant factories throughout her vast domains, we should be the last to criticise her adoption of the methods that have proved so successful here.

Conditions which now confront us in our foreign trade present the opportunity and impose upon us the duty of readjusting our commercial relations with other countries upon such a basis as shall insure freer intercourse without any sacrifice of material interests by either party. To put it in a word, reciprocity is the one factor that is of the utmost value to us in the present stage of our export trade. For 12 years past, ever since James G. Blaine attempted to bring the nations of the two Americas into closer union by the application of this principle, reciprocity has been a favorite topic of discussion by economists and business men as well. Belief in the potency of this principle, however, has been based more upon prophecy than upon experience; but now as never before do we see plainly before us conditions which call for the immediate practical application of commercial reciprocity.

We see industrial Germany aroused and alarmed by the encroachment of American competition, not in foreign neutral markets, but in the midst of the empire, where our manufacturers have been selling their machinery and products as never before. We see Russia incensed because her friendly efforts to secure commercial courtesies in return for valuable concessions extended to us have been cavalierly ignored and great injustice done to her. France has waited patiently for nearly two years to give us abundant time to consider propositions touching mutual trade concessions; but even such courteous forbearance hardly may be expected to continue without end. Even Austria and Switzerland, of less importance to us from a commercial standpoint, are expressing with much emphasis their dissatisfaction with our national policy which seeks to obtain all possible trade advantages and yet is unwilling to concede any favors in return.

To my mind there is no more important work to which the National Association of Manufacturers can apply its energy and influence in the immediate future than an effort to induce the Senate of the United States to give favorable consideration to treaties of commercial reciprocity submitted for approval by that body. The position in which the people of the United States find themselves is humiliating. After reiterated expressions of desire for reciprocity treaties, after the added emphasis given to these requests by successive Presidential messages, and even after the creation of special machinery within the Department of State for the negotiation of such international agreements, we find all of these efforts made of no effect by the refusal of the Senate to give consideration to the treaties presented for ratification. And the special plenipotentiary of the State Department abandons his work and resigns his office because of the evident futility of the undertaking.

I say to you, members of the National Association of Manufacturers, that here is a problem which can well command our most serious attention and our most determined efforts. I believe I do not overestimate its importance when I say that the continuance and further extension of our magnificent export trade in manufactured products depends more upon our willingness to barter privileges with our foreign customers than upon any other influence that we can discern at the present time. We can yield much that will be of value to others without causing loss or injury to our own interests. If we are not willing and able to adopt such a policy we must expect not only the loss of privileges we now enjoy, but also open retaliation as a punishment for our selfishness.

As the first practical step let us urge the Senate to ratify the treaty of commercial reciprocity with France, so long delayed, so repeatedly postponed, but still alive. True, it is not an ideal measure, so far as its provisions are known to us; but I believe it to be vastly better than nothing and a step in the right direction. It is better for us to have this treaty put into operation, trusting to an agreement embodying everything anybody desires with the subsequent amendments to remedy its defects, than to insist upon probability that it will be lost in its entirety. Something is always better than nothing, and it is wiser to take what we can get than to ask for too much and get nothing.

I feel justified in dwelling upon the subject of reci-

*From the annual report of the president of the National Association of Manufacturers.

procity at such length by the conviction that the matter is one that concerns us even more deeply than we can conceive without a careful study of the conditions that now prevail in those countries where our export trade centers most largely. I believe that our present duty involves something more than a perfunctory expression of opinion and hope. There is need for vigorous and continued effort to bring about the practical application of the principles of reciprocity in our commercial intercourse with other nations.

The Cincinnati Heavy Pattern Upright Drill.

The latest type of vertical drill built by the Cincinnati Machine Tool Company of Cincinnati is provided with a geared tapping attachment on the spindle. As the operator has full control he is enabled to stop, start or reverse the spindle instantly and can, therefore, do much more work. With this attachment it is possible to tap right or left hand threads equally well. A forward movement of the lever shown at the left in the engraving starts the spindle, and when the tap has gone the required depth a movement in the opposite direction reverses the spindle and returns the tap. Very heavy tapping can be done with this attachment, the 24-inch drill handling 1½-inch pipe taps or 2-inch standard taps. Cast iron can be tapped with 1-inch taps without the use of the back gears. The attachment consists of a powerful friction clutch device, which, however, becomes a positive clutch in doing very heavy work, by means of locking pins which prevent any slipping. All of the different sizes of drills built by the company can be furnished with this attachment.

THE CINCINNATI HEAVY PATTERN UPRIGHT DRILL.

Perpetual Injunction Against a Labor Union.

In the Court of Common Pleas of Montgomery County, Ohio, on June 1, Judge Kumler rendered an important decision in the injunction suit of the Dayton Mfg. Company of Dayton, Ohio, against the Metal Polishers', Buffers', Platers' and Brass Workers' Union No. 5, of Dayton, after a hearing covering 14 days. The decision permanently enjoins the defendants from in any way interfering with the business of the plaintiffs. The petition in the case alleges in substance that the plantiffs are a corporation organized under the laws of Ohio, and engaged in the manufacture of car trimmings in brass and plated goods, locomotive headlights and other articles; that in carrying on said business they have a department in the factory known as the polishers' and buffers' department, in which they have constantly employed a number of metal polishers and buffers, and that it was necessary to have said department and men employed therein for the operation of their business; that nearly all of the defendants are members of Union No. 5, which is a voluntary association whose business and proceedings are carried on in secret; that on the 9th day of October, 1899, Louis Kissinger and 16 other defendants named in the petition were in the employ of plaintiffs in the polishing and buffing department of the factory; that on said 9th day of October all of the said 17 defendants were discharged because the output of the department was not satisfactory to the general manager and other officers of the company, and that since October 9 the plaintiffs have been compelled to have a large portion of the polishing and buffing required in their business done outside of their factory.

The petition specifically charges that the defendants conspired together to prevent the plaintiffs from having their polishing and buffing done in the city of Dayton by others engaged in the same business; that they threatened the remaining employees and others who were subsequently employed by the company to take the places of those discharged with force and violence to compel them to leave the plaintiffs' service; that they threatened and intimidated certain persons from dealing with the plaintiffs; that they "picketed" the plaintiffs' factory for the purpose of intimidating their employees and caused disturbance which made it necessary to call in police assistance to preserve the peace.

The court found all the alleged acts of the defendant union illegal, and being satisfied of the truth of the allegations, from the evidence produced, gave a decree in favor of the plaintiffs for a perpetual injunction as prayed for in the petition. An appeal was taken by the defendants.

In summing up his decision, Judge Kumler said: "When we take into consideration that the defendant union is a secret organization, whose members are pledged to secrecy and who agree to stand by the legal majority, one can readily understand that it is difficult to obtain a satisfactory conclusion of the facts in the case by positive testimony. By the very necessities of the case, made so by the defendants themselves, we had to rely largely on circumstantial evidence. Circumstantial evidence, however, when satisfactory to a court or jury, is more convincing than positive testimony. The members of the union having agreed among themselves to divulge none of its proceedings and to stand by the legal majority in all matters, are presumed to have full knowledge of all that was going on. It will not do for the non-participating members to say that they should not be held responsible because they did not personally engage in the boycott or picketing, or the threats and violence. When a conspiracy is once formed among a number of individuals, the act of one is the act of all. It is equally true that the act of the legal majority of the union is the act of each of its members.

"If the defendants would live within the objects and purposes of their organization as expressed in their constitution and by-laws, all would be well and we would never hear of any trouble between the employer and the employees. But when the members of the union go beyond their conceded right to peacefully per-

suade or arbitrate and resort to threats, intimidation and violence to accomplish their ends, they must expect to face the courts, which always have and always will condemn such conduct."

The Seneca Falls Gear Cutting and Milling Attachment for Lathes.

The accompanying cuts show a new attachment for lathes which may be used instead of gear cutting and milling machines for certain kinds of work. The bracket piece which contains the driving mechanism is attached to the cross feed slide of the lathe in place of the regular tool block. The driving arbor which runs through this bracket piece transmits motion to the upright or cutter spindle by means of a pair of spiral gears, which are encased, so that they are free from dirt and chips. The driving arbor received its motion from the head stock spindle through a train of three-spur gears, one of which is screwed on to the nose of the lathe spindle and has a wide face which allows a longitudinal travel of 3 inches for the cutters. Any of the regular change gears furnished with the lathe may be used for the other two driving gears, and by using different combinations a large number of speeds for the cutter may be secured. The intermediate gear is on an adjustable quadrant which swivels on the frame piece and allows a cross movement of the entire frame piece and slide rest, and accommodates the cutters to the various sizes of work. The automatic longitudinal feed or the hand crank may be used to feed the cutter to the work.

The base of the swivel dividing head is securely clamped to the lathe bed by means of two bolts and a binder plate and has cross and vertical feeds which are operated by a hand crank. The upright part swivels on the cross feed slide, which is graduated and renders it capable of fine adjustment to any horizontal angle. The frame piece containing the spindle, indexing mechanism and the overhanging arm swivels on the vertical feed slide, which is graduated and allows fine adjustment to any vertical angle. By means of these two feed adjustments and the cross and vertical feeds, cuts of any desired angle may be made. For milling operations requiring a vise, the frame piece containing spindle and indexing device and overhanging arm is removed and the vise arrangement is attached to the vertical slide. This may also be swiveled to any angle. In using this vise arrangement the milling cutters may be driven by the head stock spindle. Chucks, centers, &c., may be used on both the head stock spindle of the lathe and the spindle of the swivel dividing head, as the taper holes and those of both spindles are of the same size. Gears may be cut as large as the swing of the lathe. A complete index is furnished, and any number of teeth may be cut from 1 to 50, and nearly all numbers up to 360. Brown & Sharpe or any standard milling and gear cutters can be used. Figs. No. 1 and 2 show the attachment arranged for cutting spur, bevel or miter gears, milling cutters, &c. Fig. 3 shows the attachment arranged for cutting flutes in taps, reamers, &c., and Fig. 4 shows it arranged for slabbing and various milling operations requiring a vise. This attachment is designed by the Seneca Falls Mfg. Company, Seneca Falls, N. Y., for use on their Star foot and power engine lathes.

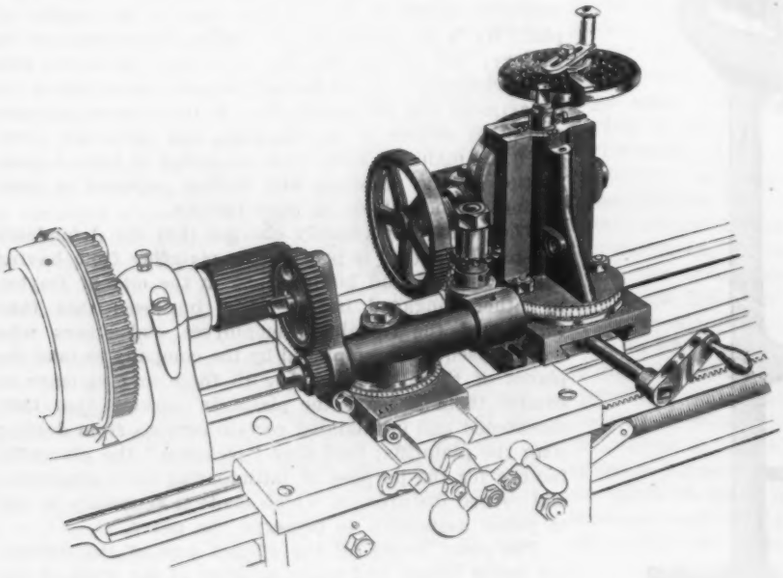


Fig. 1.—Cutting Spur Gears.

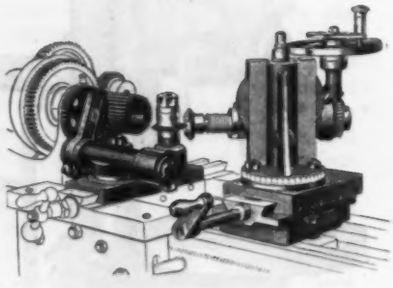


Fig. 2.—Cutting Bevel Gears.

THE SENECA FALLS GEAR CUTTING AND MILLING ATTACHMENT FOR LATHES.

The final report of the population of the United States which has been issued by the Census Bureau gives the total population of the country, including Alaska, Hawaii, the Indian Territory and Indian reservations, in 1900, as 76,303,387. The total population as ascertained by the 1890 census was 63,069,756. For the decade of 1870 to 1880 the increase in the population was 26 per cent., which was about the same rate as that during the preceding ten years; from 1880 to 1890 the increase was just under 25 per cent., and from 1890 to 1900, 21 per cent. The report states that Rhode Island, with 407 inhabitants to the square mile, is the most densely settled State in the Union, Massachusetts coming next with 390 inhabitants to the square mile, New Jersey third with 250, and Connecticut fourth with 187. Four other States have more than 100 inhabitants to the square mile—viz., New York with 152.6, Pennsylvania with 140.1, Maryland with 120.5, and Ohio with 102 to a square mile. Alaska has but one person to every 10 square miles, and Nevada only four persons to a like area.

The National Tube Company of the United States Steel Corporation on June 3 voluntarily advanced the wages of all the workers in their Youngstown, Ohio, plant, averaging 17½ cents per day. The increase affects 425 men.

It is reported from London that the British Government has decided to introduce new American labor saving machinery, such as pneumatic drilling and riveting machines, &c., at the naval dockyard at Portsmouth, England.

Notes from Great Britain.

Offices of *The Iron Age*, Hastings House, Norfolk Street, Strand, W. C.

The Markets.

In all the iron centers the prospects of the market have been brighter than for some time past. In Glasgow the threatened coal strike has practically been averted, both employers and men agreeing to submit their differences to arbitration. The result of this has been to engender a spirit of greater confidence, and prices undoubtedly have stiffened. In Manchester the tone is more confident, and for prompt delivery prices have become stronger. A feeling, however, of uncertainty for the future is dominant, and buying in great quantities is exceptional. Jobbers are quoting below current rates for forward orders. In the finished iron prices are being cut very low, quotations being considerably under the quoted list. In Birmingham, notwithstanding the approach of the Whitsun holiday, business is undoubtedly more brisk than it has been during this year. At the iron trade meeting, held last Thursday, advances in the price of black and galvanized sheets were made. All through the year both these goods have been in a depressed condition, but the galvanized branch is showing more life, there being a considerable increase in the number of orders, and a corresponding increase in price. This has led to an advance in the price of spelter, while black sheets have advanced $1.25. Several contracts are reported for doubles at £8 ($40). The greater firmness of market prices is to some extent due to an advance in the price of coke. Firmer prices are being obtained for steel hoops. In Sheffield there is a hopeful tone in the iron market, but the steel trade is quiet, and buyers are only stocking for immediate requirements. Thus, a bird's-eye view of trade in the metal centers shows marked improvement. But while orders are now more plentiful in nearly all branches of the metal trades the tone of the market can hardly be described as buoyant. Steady, solid business, mitigated by doubts of the future, about describes the situation. In Glasgow a fortnight ago the Clyde Bridge Steel Company closed down their works on the ground that they could not make steel plates at £5 15s. ($28.75), less 5 per cent., profitably. As this firm have an output of 70,000 tons per annum the stoppage naturally shortened supplies and prices promptly stiffened. At the present moment steel plates are selling at £5 15s., compared with £5 5s. net a fortnight ago. The Clyde Bridge Works are still idle, and the directors of the company affirm that they will continue idle until prices touch £6 net. The pig iron warrant market has been slack during the week, prices being slightly easier. This is, to some extent, accounted for by the receipt of a cargo of Canadian pig iron, the quality of which, it is reported, has given satisfaction. It is used by founders who had previously been buyers of Cleveland iron. Prices of the home made article had, in consequence, to be quoted from 6 pence to 1 shilling per ton cheaper. There is every prospect that Canadian pig iron will become a settled factor in the Glasgow market for some time. Orders for machinery and metals in increasing quantities have recently been received from India, Burmah and Argentina. France and Germany have been buying largely English machinery, shop tools, guns and sanitary appliances.

The Tin Plate Trade.

A few weeks ago there appeared in *The Iron Age* a criticism upon the condition of the tin plate trade in South Wales. When everything that can be said in favor of the South Wales tin plate trade has been uttered the broad fact remains that this trade continues in a parlous condition. In many respects it is the most incompetently conducted trade in this country. A shocking absence of technical information, a complete lack of progressive ideas both among employers and employed, is slowly telling its tale. Now and again we have a temporary spurt, but the market invariably reverts to its old stagnant condition. It is perfectly true that the Dingley tariff hit the South Wales trade very hard indeed, and it was to be expected that for some time to come trade would be bad. But years have now elapsed, and the market shows no signs of improvement. Yet a careful survey of the markets of the world will convince any unprejudiced observer that there is a growing demand in India, Australia, South America, Eastern Europe and elsewhere for tin plates of varying quantities and qualities. If the South Wales manufacturers had a free hand, doubtless they would associate for the purposes of opening up markets in various parts of the world, but they seem to be entirely in the hands of the jobbers, and in many cases are only the nominal proprietors of their own works. Now that the idea of trusts and combines is in the air, it must surely strike some financier that the tin plate trade admirably lends itself to organic combination. It is highly localized, the grades are not many and are easily distinguished, while a little competent arrangement of the works would satisfactorily settle difficulties as to the quality of the tin plates required for different markets. At the end of April there were 335 mills working either fully or partially, and 53 at a standstill. I was informed a short time ago by an expert that these mills would average out about £3000 a mill. It would not be difficult to arrive at the good will. If this were done, and a South Wales Tin Plate Trust were formed, I have no doubt that trade could

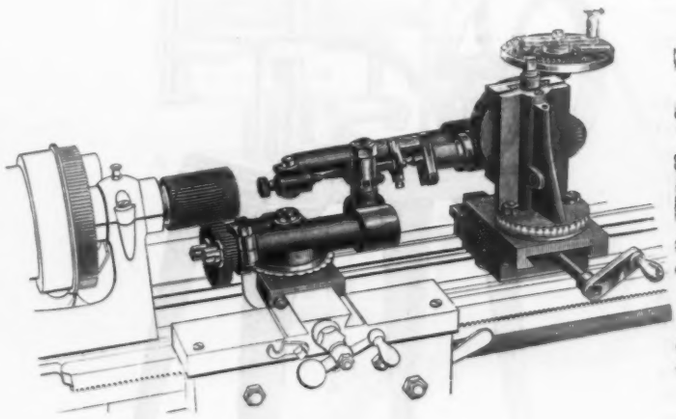


Fig. 3.—Cutting Flutes on Taps.

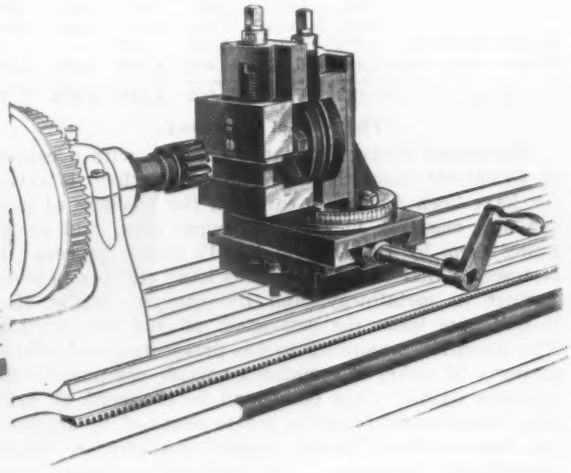


Fig. 4.—Slabbing.

THE SENECA FALLS GEAR CUTTING AND MILLING ATTACHMENT FOR LATHES.

be galvanized into life again, new markets opened up, and new ideas for the use of tin plates utilized. I remember some years ago a prominent South Wales merchant suggested that tin plate should be used for packing tea cases instead of lead, as is now the case. This may be impracticable, but (at least on the face of things) it would seem that the uses of tin plate can be considerably increased in number and value. The latest details as to employment at tin plate works during April show very clearly the present position. The first table shows the number of mills at the works at three comparative periods, and the second table indicates the stationary or backward character of the export trade:

	No. of works open.	No. of mills in such works. Working.	Not working.	Total
Works giving full employment..	42	202	..	202
Works giving partial employment	25	133	53	186
Total at end of April, 1901.	67	335	53	388
Corresponding total for March, 1901	62	293	62	355
Corresponding total for April, 1900	84	413	65	478

The exports of tin plates and black plates from the United Kingdom in the months covered by the above:

	Tin plates.			Black plates.		
	April, 1901. Tons.	March, 1901. Tons.	April, 1900. Tons.	April, 1901. Tons.	March, 1901. Tons.	April, 1900. Tons.
To United States..	3,676	2,044	3,594	49	....	14
To other countries.	19,446	16,050	19,908	4,169	2,398	5,210
Total.....	23,122	18,094	23,502	4,218	2,398	5,224

The Nickel Company.

The Mond Nickel Company, Limited, with a capital of $3,000,000, more than two-thirds of which is called up, have been formed to carry on the business of mining and smelting nickel and copper ores, and of refining them by Dr. Ludwig Mond's patent process. It is asserted that this new process is an entirely new departure in metallurgy, and the company claim that it will give them the command of the nickel trade. The invention, according to the prospectus, utilizes the property of nickel of forming a volatile compound with carbonic oxide. This compound is produced at ordinary temperature from the matte obtained by smelting and bessemerizing nickel copper ores after a simple preliminary treatment. On applying moderate heat pure metallic nickel is obtained in salable form. It is further asserted that this process has been fully worked out in all details on a manufacturing scale at small works at Smethwick, near Birmingham, where over 50 tons of nickel have been manufactured and delivered to a number of large consumers, from whom satisfactory reports have been received as to its quality. Special machinery, essential to the successful working of the process, has been invented and protected by separate patents of recent date. The directorate is a strong one. Dr. Ludwig Mond, Sir Andrew Noble, chairman of Sir William G. Armstrong, Whitworth & Co., Limited; Hon. G. A. Drummond, vice-president of the Bank of Montreal; Charles J. Galloway, J. P., chairman of Galloways, Limited, Manchester; James Ross, vice-president of the Montreal Street Railway Company, and others.

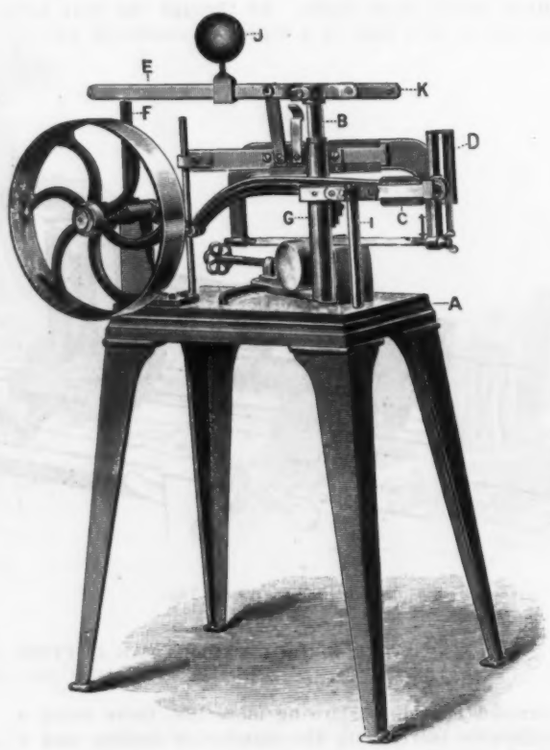
The Canadian Bounty.

It is reported that Mr. Fielding, the Canadian Minister of Finance, has informed some British shipbuilding firms that if they will construct the ships for the proposed fast steam ship service in Canada, they shall have a substantial bonus. A prominent British financial paper remarks on this that it is sure our shipbuilders will bear in mind the great free trade doctrine that England's shipbuilding is strong because it is not pampered, and refuse the proffered bribe. I am not quite sure if these words are "writ sarcastick." S. G. H.

Mayor Van Wyck of New York City has signed an ordinance of the Municipal Assembly affirming the plans of the Rapid Transit Commission for a railway tunnel under the East River connecting the boroughs of Manhattan and Brooklyn.

The Olmsted Power Hack Saw.

The power hack saw manufactured by L. H. Olmsted of Hasbrouck Heights, N. J., is so designed as to provide a firm support for the saw frame and the saw guide, thus insuring a true vertical cut through the work. Means are provided for raising and lowering the saw and for conveniently adjusting the pressure upon the saw. There is a swivel vise for holding work, with a pointer or indicator to move along a segment marked to indicate various angles, and that can be secured at any angle desired. In this machine a hack saw is secured in a frame, to which is given a horizontal reciprocating motion by means of a revolving crank and connecting rod. Referring to the engraving, B is a stout post firmly fixed in the bed piece A; a sleeve, G, embraces this post and is adjustable up and down. To this sleeve is secured a horizontal slideway upon which the saw frame slides. The head C moves on a slideway that is supported by the post I and extends into a deep vertical groove, D, in the saw frame. The connecting rod unites the head with the crank, so that when the machine is in motion the saw



THE OLMSTED POWER HACK SAW.

frame is reciprocated the same whether in a high or low position. The saw guide H is attached to the sleeve G close to the work and is adjustable in all directions. This is important to prevent the breaking of saws and to insure a true vertical cut in the work. The studs upon which the saw is hooked in the reciprocating frame hold the sides of the saw in a vertical position at all times without adjusting. It will be observed that the lowering and raising lever E, starting lever F and vise screw wheel are all conveniently located at the front of the machine. The weight J is adjustable on the lever E to give any desired pressure on the saw and is held fast by turning the ball. No countershaft is required, there being a clutch for starting and stopping attached to the machine. It can be placed under a main shaft and belted from a pulley or coupling.

A movement is said to be on foot to bring together in an association all the manufacturers of aluminum goods in the United States. A proposition has been made that the first meeting should be held at Buffalo, N. Y., during the life of the Pan-American Exposition, as Buffalo is somewhat of a headquarters of the aluminum industry.

Spanish-American Notes.

TAPACHULA, CHIAPAS, May, 1901.—This is the section toward which the railroads of Mexico and Central America are converging from both north and south. Chiapas has possibilities in mining, not only gold and silver, but copper and iron as well. The two latter metals are untouched, especially in the districts of San Cristobal and toward Soconusco, where magnetic ores crop out very often. Several parties are here from San Francisco looking into the beds of hematite near this town; if found profitable works will be established, with a narrow gauge railroad to San Benito, on the Pacific.

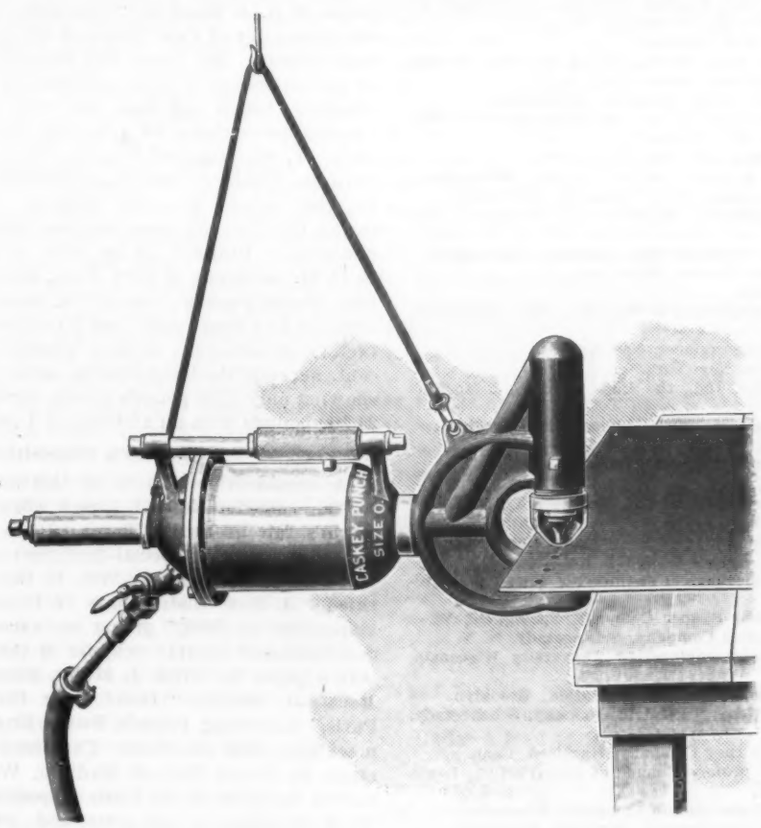
Returning to the railroads, the Cuernavaca-Pacific is surely making its way toward the south; many believe that within six months the road will reach the ocean. The Central Mexican is making headway on its Guadalajara branch via Colima, where a short line is already running to the Pacific port of Manzanillo. According to the best calculations, it will cost fully $4,000,000 to build the necessary steel piers at Manzanillo, and as much more to build a sea wall; then steamers of 6000 tons can anchor within the harbor, whereas now all craft of any size lies two or more miles out at sea, at the mercy of the northers which often spring up in a few minutes along this coast. The Mexican Government is greatly interested in opening up its Pacific States; as they now are they do not produce one-hundredth of what they should—no rail or other lines of communication with the interior, with immense natural wealth lying idle for want of capital and proper exits. Guerrero, Chiapas, Jalisco and Oaxaca all have resources which Central Mexico is bereft of, but their production is limited to-day to coffee, hides, lumber and small quantities of ore for export. The Government has begun dredging several of the navigable rivers in these States, and bids for a number of steel bridges are being called for.

With the change of ownership in the Mexican Central, the natives are hoping that American capital will now flow more readily into Central, and especially Southern, Mexico—the land of rubber, cacao, coffee and precious woods.

With all the drawbacks spoken of, it is easily noted hereabouts that American machinery, plows and farming implements, bicycles, buggies and rifles, revolvers and shotguns are much more common than they were four or five years ago. C.

The Caskey Portable Pneumatic Punch.

The portable pneumatic punch built by F. F. Slocomb & Co. of Wilmington, Del., was originally designed by a shipbuilding firm for use in torpedo boat construction. The original tool constructed for this purpose is still in use, and actually did 90 per cent. of the work on the two boats for which it was intended. Of course some improvements were suggested, and these have been embodied in the punch as now constructed. One of the chief advantages of a tool of this kind is on work that either cannot be reached by the power punch at all or which requires to be taken down and carried to the punch, and then put in place again.



THE CASKEY PORTABLE PNEUMATIC PUNCH.

In construction the tool is quite simple, and this gives it great durability. The chief distinctive feature is a hollow piston containing oil, within a prolongation of which a stationary tube is adapted to telescope, the oil being thereby forced into and through the tube and thence upon the plunger, where it exerts accumulated pressure. The air which drives the piston during the stroke is utilized to drive it back for another, being finally expelled through the exhaust during the next succeeding stroke. This, as will be apparent, effects an important saving in the amount of air used.

The punch is built in four sizes. The smallest, or size 0, weighing 28 pounds, is adapted to work up to 3-16 inch; size 1, shown in cut, weighs 145 pounds and will punch up to ⅜ inch; sizes 2 and 3 are adapted for punching ½ inch and ⅝ inch plates, respectively.

Ex-Mayor Rettew of Carbondale, Pa., recently employed as traveling engineer for the Baldwin Locomotive Works of Philadelphia, has been appointed master mechanic of the Pocahontas Coal & Iron Company, with headquarters at Pocahontas, Va.

The Mechanical Engineers.

THE MILWAUKEE CONVENTION.

A report was given in our last issue of the first day's proceedings of the forty-third meeting of the American Society of Mechanical Engineers, held last week at Milwaukee, Wis. Following is a partial list of the members and guests registered as in attendance on this occasion:

W. F. M. Goss, Dean Schools of Engineering, Purdue University, Lafayette, Ind.
J. B. Stanwood, Technical School, Cincinnati.
W. H. McFarland, Westinghouse Electrical & Mfg. Company, Pittsburgh.
Robert W. Hunt, Robert W. Hunt & Co., Chicago.
E. H. Parks, Brown & Sharpe Mfg. Company, Providence, R. I.
E. E. Wood, Jones & Lamson Machine Company, Springfield, Vt.
Wm. Ritchie, the Advance Mfg. Company, Hamilton.
Geo. W. Cope, *The Iron Age*, Chicago.
D. S. Jacobus, professor Expl. Mechs. Engrg. Physics, Stevens Institute of Technology, Jersey City, N. J.
Irving H. Reynolds, E. P. Allis Company, Milwaukee.
W. G. Starkweather, secretary Local Committee, superintendent Milwaukee Automobile Company.
J. I. Astrom, Nordberg Mfg. Company, Milwaukee.
Chas. P. Bossert, Pfister & Vogel Leather Company, Milwaukee.
John Clark Finney, Wisconsin Trust Company, Milwaukee.
Frank Kempsmith, Kempsmith Machine Tool Company, Milwaukee.
Bruno Victor Nordberg, Nordberg Mfg. Company, Milwaukee.
Edwin Reynolds, Reliance Works, Milwaukee.
Henry Weickel, Milwaukee.
Stephen W. Baldwin, Pennsylvania & Maryland Steel Companies, New York.
Gus C. Henning, consulting engineer, New York.
C. W. Hunt, 45 Broadway, New York.
Geo. T. Ladd, Fort Wayne, Ind., the Bass Foundry & Machine Company.
E. E. Keller, Westinghouse Machine Company, Pittsburgh.
Wm. A. Bole, Pittsburgh.
Ambrose Swasey, Warner & Swasey, Cleveland.
Jos. G. Prosser, Chester, Ill.
John Riddell, General Electric Company, Schenectady, N. Y.
F. M. Rites, Ithaca, N. Y.
A. K. Mansfield, Buckeye Engineering Company, Salem, Ohio.
W. F. Barnes, W. F. & J. Barnes Company, Rockford, Ill.
G. W. Bissell, professor mechanical engineering Iowa State College, Ames, Iowa.
E. R. Fellows, Fellows Gear Shaper Company, Springfield, Vt.
H. G. Reist, General Electric Company, Schenectady, N. Y.
Storm Bull, professor steam engineering, University Wisconsin, Madison.
Kenneth Torrance, Ridgewood Pumping Station, Brooklyn.
S. L. G. Griswold Knox, General Electric Company, Schenectady, N. Y.
W. S. Jacobs, Pratt & Whitney Company, Hartford, Conn.
C. E. Du Puy, assistant professor machine construction, Lewis Institute, Chicago.
V. E. Edwards, Morgan Construction Company, Worcester.
Paul B. Morgan, Morgan Construction Company, Worcester.
T. W. Hugo, consulting mechanical engineer, Duluth, Minn.

THURSDAY MORNING.

Prof. D. S. Jacobus of Hoboken, N. J., read the preliminary report of the committee appointed to codify and standardize the methods of making engine tests. Attached to the report were a set of rules for conducting steam engine tests and another set for conducting gas and oil engine tests, hot air engines not having been considered, as those in the market are of comparatively small size and seldom tested. The rules specifically treated all the factors essential in testing engines. Blank forms were given to be followed in making records of tests. The reports was followed by a discussion, to which written contributions were made by W. W. Christy of Paterson, N. J.; H. W. Hibbard of Ithaca, N. Y., and Prof. Robert H. Thurston of Ithaca. E. T. Sederholm of Chicago discussed it orally. The diagrams and the brake were the principal subjects of criticism. A motion by C. W. Hunt was adopted requesting the council of the society to consider, and if found practicable and desirable, to prepare suitable blanks for recording engine tests for sale to the members.

Prof. James B. Stanwood of Cincinnati read the second tentative report of the Committee on Standardizing Tests of Dynamos and Engines, stating that they had endeavored to reduce the number of units to be considered in conducting tests. The plan which will be followed was given in detail. This report had not been put in type, but will shortly be printed and sent to the members. It was discussed at some length by F. V. Henshaw of Ampere, N. J.; H. G. Reist of Schenectady, N. Y.; A. K. Mansfield of Salem, Ohio; Wm. H. Bryan of St. Louis, and W. M. McFarland of Pittsburgh, the last named also one of the committee. Mr. McFarland stated that a crying necessity existed for standardizing tests of direct current dynamos.

Opportunity was given to members to discuss the paper of A. J. Rossi on "The Influence of Titanium on the Properties of Cast Iron and Steel," read on Wednesday morning. Mr. Rossi had brought for the inspection of the members a large number of samples of ferrotitanium, titanic pig iron, and iron and steel in which varying percentages of titanium had been used as an alloy. T. W. Hugo of Duluth, Minn., asked how much titanium should be used to accomplish good results, and to what extent it would displace nickel. Mr. Rossi stated that he had been making demonstrations of the qualities of titanium as an alloy of cast iron with Dr. R. G. G. Moldenke of New York, secretary of the American Foundrymen's Association, using from 1 to 4 per cent. It had been found that 2 per cent. secured as satisfactory results as a greater quantity. But even 1 per cent. accomplished remarkable effects. A weak casting showing only 1700 pounds tensile strength had developed 24,500 pounds with an addition of 1 per cent. of titanium.

The Paris Exposition.

A considerable portion of this session was devoted to the consideration of topics suggested by the late world's fair at Paris. Three papers were read in succession, treating of special features noted by the writers. The first was a paper by Wm. E. Reed of Cleveland, entitled "A Few Instruments of Precision at the Paris Exposition of 1900," giving an exceedingly interesting description of notable exhibits in this line. The second was a paper by Fred. J. Miller, editor of the *American Machinist*, entitled "Bevel Gear Cutting Machines at Paris," describing French, Swiss, English and American machines thus exhibited. The third was an elaborate study by Storm Bull of Madison, Wis., of "The Locomotive Exhibits at the Paris Exposition of 1900." Prof. W. F. M. Goss of Lafayette, Ind., said he was pleased to see in Mr. Bull's paper the prominence given to the compound engine known as Northern Railway of France engine. American locomotive designers have adopted simplicity as their predominant idea, and have been slow to adopt anything leading to complication. The question is how much complication is admissible. The Northern Railway of France engine consists of four complete engines, two of which are on the inside and two on the outside. This secures a great division of power with many advantages, prominent among which are, first, the perfect balancing of the engine, and, second, the distribution of the power throughout a greater length of frame. An objection that may be raised to the division of power is that by the multiplication of parts the cost of repairs and chances of breakage may be increased. But it does not necessarily follow that an increase in parts will increase breakage, because less stress is brought on the parts. Professor Goss pointed out a number of other reasons for his opinion that this type of engine would be suitable for adoption on American railroads.

The secretary read a paper by George H. Marr of Waterville, Maine, entitled "A Method of Filing and Indexing Engineering Literature, Notes, Data, &c." He uses a document file consisting of strong manila envelopes, 6½ x 10 inches, with the front of the envelope

ruled in columns in which to write the subject, the author's name, and the publication from which the clipping is taken, with its date. Details are given showing how the subjects are handled and how the envelopes are arranged. This provoked considerable discussion, Prof. L. P. Breckinridge of Urbana, Ill., asserting that every man adopts his own method of filing such matters, and believes it is the best, but he thought that if it was possible to secure uniformity in this respect, the final plan will be something of a decimal system, such as is used in the large libraries. He described as of interest in this connection a plan he had recently adopted of making assignments to his students in making up card indexes of the technical journals. These card indexes had been subsequently furnished to parties desiring such information and had been highly commended.

FRIDAY MORNING.

In the absence of the author, the secretary read a paper by Wm. O. Webber of Boston, entitled "A Filtration Plant at Albany." An interesting description was given of this filtration plant, which, briefly, consists of pumping water through a group of vertical pipes, each pierced with ⅜-inch holes, thus thoroughly aerating it, after which it falls into a large sedimentation basin. The water is pumped up to this filtration basin by two 24-inch Webber centrifugal pumps, as made by the Lawrence Machine Company, which are directly connected to two 10 x 18 x 10 Watertown vertical cross compound condensing steam engines. These engines are supplied with steam from two Hunter vertical boilers of approximately 120 horse-power each. Vacuum is produced by two Deane 6 x 9 x 12 condensing pumps and the boilers are fed by two Blessing 4½ x 6 x 2½ boiler feed pumps. The pumps have a guaranteed capacity of 16,000,000 gallons each per 24 hours against 18 feet, or 12,000,000 gallons per 24 hours against 24 feet. Upon leaving the pumping station the water passes through a 36-inch Venturi meter, which records the amount of water pumped. The results of a 24-hour test of one of the pumps, a boiler and an engine were given. Among other data given, the results showed the efficiency of the pumps and engines to be 50.5 per cent.

The paper was discussed by Edward T. Adams of Milwaukee, who criticised the installation, claiming that its efficiency was 60 per cent. below that of another type of pump and engine. It was not a typical example of good practice, although the conditions were most favorable. He gave a description of the performance of sewage pumps at Boston, which, under far less favorable conditions, showed much higher efficiency.

The secretary read another paper by the same author, entitled

Test of an Hydraulic Air Compressor.

This paper was the subject of a written discussion by Prof. Robert H. Thurston, who expressed his surprise at the performance of the apparatus. A possible 40 per cent. of efficiency might have been expected, but as it yielded so much more power it was evidently a method of generation worthy of study, and he hoped that more information would be obtainable.

The secretary read an abstract of a paper by A. Francis Bardwell and James Hamilton of Boston entitled

The Bardwell Votometer.

This is a voting machine constructed of steel, brass and aluminum, designed to expedite the process of voting, maintain the secrecy of the ballot, prevent tampering with the count of the votes and enable the total result of the voting at each poll to be known as soon as the last man has voted. The secretary stated that the description of this machine as part of the proceedings of the society was the result of his requesting the members to name subjects on which they would like to have papers prepared, and many had named the voting machine. Professor Thurston contributed a letter of strong approval of the machine and its purpose. T. W. Hugo of Duluth, Minn., who is now Mayor of that city, made a very humorous speech on the subject of voting and the difficulties encountered by naturalized citizens ignorant of the English language in exercising the right of suffrage. Storm Bull, Mayor of Madison, Wis.; John E. Sweet of Syracuse, N. Y., and others participated in the general discussion.

In the absence of the author the secretary read a paper by Francis H. Stillman of New York entitled

Pulley Press Valve,

an abstract of which will be presented in a later issue.

The secretary read a paper by C. H. Benjamin of Cleveland, Ohio, entitled

Some Experiments on Ball Step Bearings.

The author first states that most of the published experiments on steel balls have merely shown the crushing strength of the balls under a dead load. In service balls do not fail in this way, and figures for the ultimate crushing strength are very misleading when used as a basis for designing bearings. Some other experiments have been made on bearings running at a moderately high speed under light loads to determine the frictional resistance. It seemed desirable to make some further experiments, which should show the behavior of steel balls when running at various speeds and under gradually increasing pressures, to measure the horse-power consumed and to determine the manner of failure.

Some investigations of this nature were made, under the direction of the writer, by senior students of the Case School of Applied Science during the years 1899-1900. The apparatus to be described was designed and built by Messrs. Grothe and Stephan, of the class of 1899, and a few experiments made. The work was continued the next year by Messrs. Hanlon and Harper of the class of 1900.

Some of the phenomena which developed in the course of these experiments were novel and of such interest as to warrant their publication.

The experiments so far made have been confined to thrust or step bearings. With the device employed it was possible to test step bearings with different sizes and arrangements of balls under any desired pressure, and at the same time to measure the power consumed in driving. To establish a zero reading of power the apparatus was driven without any load on the bearings, and the horse-power noted.

The steel balls and the hardened plates were obtained of firms making a specialty of this kind of work. The first experiments were made with ¼-inch balls and flat plates, the speed being 375 revolutions a minute.

As the pressure on the bearing was increased it was found that the balls exerted a considerable radial pressure on the outer retaining ring of the apparatus.

Under a load of 2000 pounds this pressure was sufficient to cut a groove in the retaining ring. When the ring was allowed to revolve freely with the balls, each ball would indent the ring, and when the ring was removed 31 distinct dents could be seen at regular intervals, one for each ball.

Thinking that this might be due to springing of the plates under pressure, we made the next lot of plates slightly concave at angles of 10 minutes, 20 minutes, 30 minutes, and 40 minutes, so as to bring the pressure of the rings directly above and below the ball circles. Instead of remedying the difficulty, this made it worse, the outward pressure being greater than before.

At the speed used (375 revolutions per minute) the centrifugal force was not enough to account for the radial pressure, and the following was suggested as an explanation:

A pressure of 2000 pounds and upward on a bearing of this size (about 30 ¼-inch balls) is probably sufficient to slightly distort the balls and change each sphere into a partial cylinder at the touching points. While of this shape it would tend to roll in a straight line or a tangent to the circle, thus pressing against the outer retaining ring.

Acting on this suggestion we next had plates ground slightly convex, the first angle tried being 20 minutes; 40 minutes and then 1 degree were tried, with a decided improvement in the conditions, it being possible with the last angle to increase the pressure up to 3000 pounds without excessive friction.

An angle of 1 degree 30 minutes being tried, the radial pressure again increased. It was supposed that the angle between the plates, now 3 degrees, was sufficient to cause the balls to be wedged out against the ring.

The subsequent experiments were made with plates having each an angle of 1 degree, or 2 degrees between the plates. Circular tongs were made with which to grasp the retaining rings and determine when the radial pressure became excessive. It may be stated in general that under no circumstances was it possible to load a bearing of the size mentioned over 3000 pounds without seriously impairing its efficiency and durability.

Now 30 ¼-inch balls should have (according to the results of experiments on direct compression) an ultimate combined strength of about 180,000 pounds, and a safe working strength of about 36,000 pounds.

At one-twelfth of this working load the balls in such a bearing would lose all value as transmission elements. The retaining ring, when carried around by the balls, was always liable to rub against either top or bottom plate and cause abrasion and heating.

When the balls were retained in one circle the continual travel in one path soon grooved the plates enough to injure them. One plate developed radial cracks under this treatment, probably on account of the stretching of the outer circumference by the drawing effect of the balls.

Different radii of ball circles and different sizes of balls were tried, as may be seen from the tables.

One plate was broken, the circle of balls having a diameter of about 2.25 inches and the pressure being 4000 pounds, or about 140 pounds on each ¼-inch ball. In this case the plate had evidently been overheated in hardening.

Several times balls were broken after running two or three hours under pressures varying from 3000 to 3500 pounds, or from 120 to 150 pounds per ¼-inch ball. The heating due to the pressure against the retaining ring was sometimes sufficient to turn the balls blue. The fractured balls, however, showed no appearance of peeling or flaking, but were broken square across at or near a diameter.

In one series of experiments the whole space between flat plates was filled with ¼-inch balls put in indiscriminately. As might have been expected, the friction was enormously increased by this arrangement, and the belt slipped at a load of 2000 pounds.

A three-point bearing did not give as good results as the flat plates, but this was partly due to the fact that the plates in this case were not ground.

We obtained the best results with a ring cage with holes so arranged as to give each ball a different path, and thus distribute the pressure and wear on the plates. As flat plates were necessary with this arrangement, considerable outward pressure occurred.

In making the experiments the balls were carefully cleaned and although greasy were not oiled. The usual speed was about 260 revolutions per minute, and the pressure was increased by additions of 500 pounds until the belt slipped. The bearing was run for ten minutes under each pressure.

The gross horse-power was measured for each load by the dynamometer, and the friction horse-power determined by running the bearing without pressure.

Under heavy pressures and long continued wear a ball step bearing is a very uncertain quantity, unless so designed as to eliminate to the greatest extent possible the outward radial pressure of the balls. No pressure in any way approaching the crushing strength of the balls can be tolerated.

Prof. Thomas Gray of Terre Haute, Ind., contributed a written discussion on this subject which was illustrated by drawings reproduced on the blackboard. Describing experiments on the same lines with different apparatus, he stated that the balls gradually increased the radius of their path. A 6-inch plate was not sufficient for a ball 3-16 inch in diameter. With balls 3-16 inch in diameter a load of 40 pounds per ball was sufficient to damage the plate. He concurred with Mr. Benjamin that the load to be carried by a ball must be only a small fraction of its crushing strength. C. W. Hunt of New York stated that he had only had experience with balls carrying light loads and believed that they could only be used for purposes which will not affect their sphericity.

A paper was read by the secretary which had been prepared by J. I. Astrom of Helsingfors, Finland, entitled

Determination of Fly Wheels to Keep the Angular Variation of an Engine Within a Fixed Limit.

This was an exhaustive study of methods by which the regulating capacity of a fly wheel upon the motion of an engine may be determined. The discussion was opened by W. L. Abbott of Chicago, who, by means of large charts, demonstrated his method of determining the augular variation of a fly wheel to run compound condensing engines in parallel. The process is involved, requiring many computations. He is now applying it to a 3500 horse-power engine. Prof. P. W. Chamberlain of Chicago reproduced on the blackboard a device he employs for the purpose of determining the degree of unsteadiness of a fly wheel. This, however, had only been tested on an engine of 150 horse-power. A. K. Mansfield of Salem, Ohio, asked the object of determining the angularity of a fly wheel. Back of it is the question of what it is to do. With this known, and any doubt exists that it may not do what it should, he makes it heavier. He has been in the habit of determining this by experiment, as, for instance, in building rolling mill engines, and then making the wheel a little heavier. Mr. Abbott said that it would be quite unfortunate to set up a 3000 or 5000 horse-power engine and then find the wheel too light. It is well to make a calculation in advance.

In the absence of the author the secretary read a paper by Walter S. Russel of Detroit, Mich., entitled "A Special Form of Boring and Facing Machine."

FRIDAY EVENING.

This was the final session of the meeting. Papers were read by C. H. Robertson of Lafayette, Ind., entitled "Efficiency Tests of 125 Horse-Power Gas Engine;" by J. R. Fordyce of Little Rock, Ark., entitled "A Method of Preparing and Baling Cotton in Round Bales;" by M. P. Wood of New York, entitled "Protecting Ferric Structures;" by F. H. Daniels of Worcester, Mass., entitled "An Improved Type of Ingot Heating Furnace," and by H. H. Suplee of New York, "The Entertainment of the Visiting Engineers in Europe in 1900."

The Entertainment.

The citizens of Milwaukee have always been noted for their hospitality, but they won fresh laurels on this occasion. An informal reception and smoker in the Plankinton enabled greetings to be exchanged and sociability encouraged at the very beginning of the meeting on Tuesday evening. A more formal reception and banquet at the famous Deutscher Club of Milwaukee on Wednesday evening was the special event of the week and will long be remembered by those who were so fortunate as to be present. A trolley ride to Waukesha, a city famous throughout the country for its numerous springs of purest water, was the feature which made Thursday afternoon a pleasurable period. Another smoker at the Plankinton followed in the evening. On Friday afternoon carriages were provided *ad libitum*, and a drive through the city and its beautiful environs added another enjoyable experience. The ladies accompanying many of the members and guests were thoughtfully cared for during the entire week, trips for their entertainment having been prepared daily. They were not only furnished with carriages, but with automobiles. The manufacturers of Milwaukee threw open their establishments and welcomed all visitors most cordially. The Kempsmith Mfg. Company celebrated the occasion by issuing as a souvenir an exquisitely illustrated invitation to their works, binding with the invitation pictures of their milling machines.

An Improved Type of Ingot Heating Furnace.*

BY F. H. DANIELS, WORCESTER, MASS.

In the process of reducing steel ingots to a form suitable for further use in the manufacture of wire, &c., no operation is of greater importance than that of bringing the ingot to a proper heat for rolling. For this purpose a number of forms of heating apparatus have been devised. The earliest, and one which, on account of its many excellent features, still remains in considerable favor, was known as the "soaking pit." While it is not the function of this paper to describe in detail this arrangement, nor some others which have been devised for a similar purpose, a few general remarks regarding them will not be out of place.

The soaking pit then, as generally used, consists, as the name implies, of a chamber into which the ingots are charged vertically from the top, and from which they are later removed in the same manner. This form of furnace is also supplied with regenerative chambers and their concomitant accessories. The introduction of the regenerative principle involves not only a large first cost, including a number of expensive flues, but, on account of the somewhat complicated system of valves, &c., the expense of maintenance is very considerable.

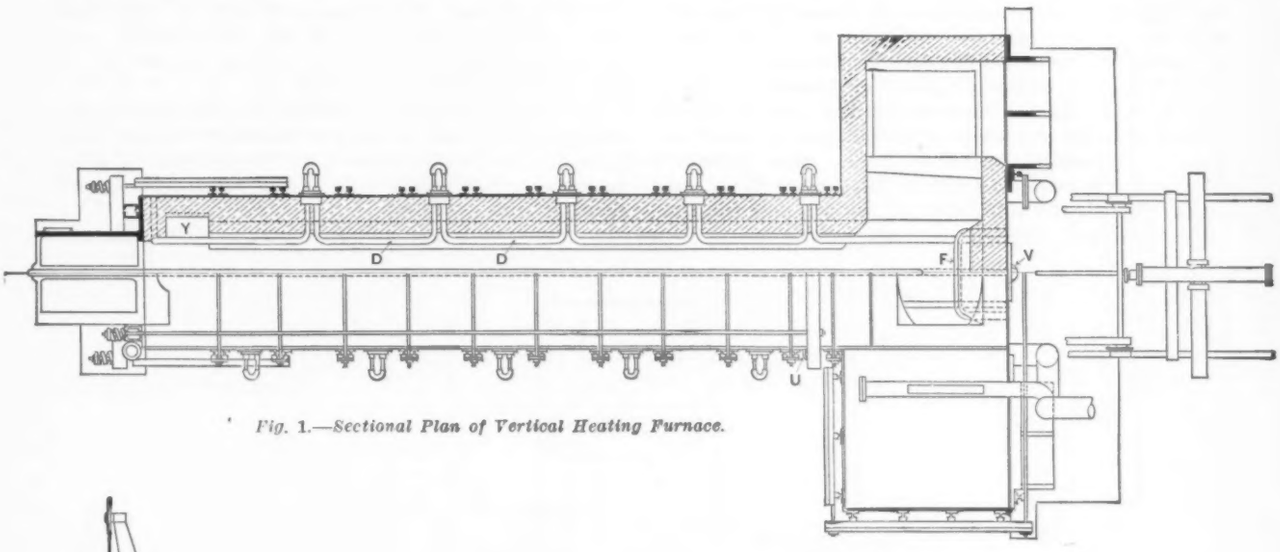


Fig. 1.—Sectional Plan of Vertical Heating Furnace.

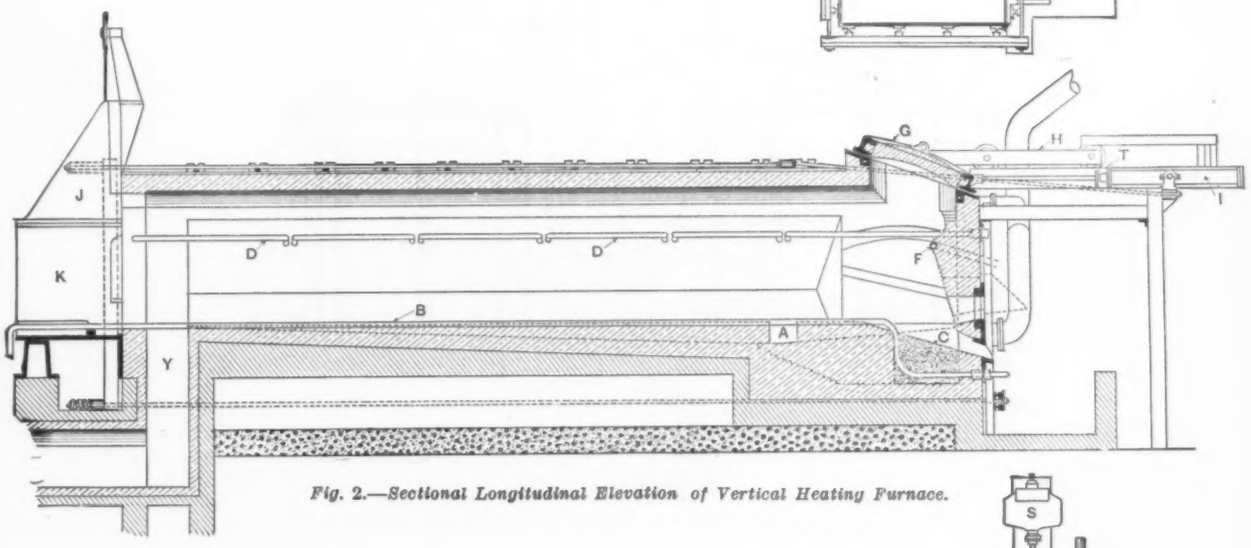


Fig. 2.—Sectional Longitudinal Elevation of Vertical Heating Furnace.

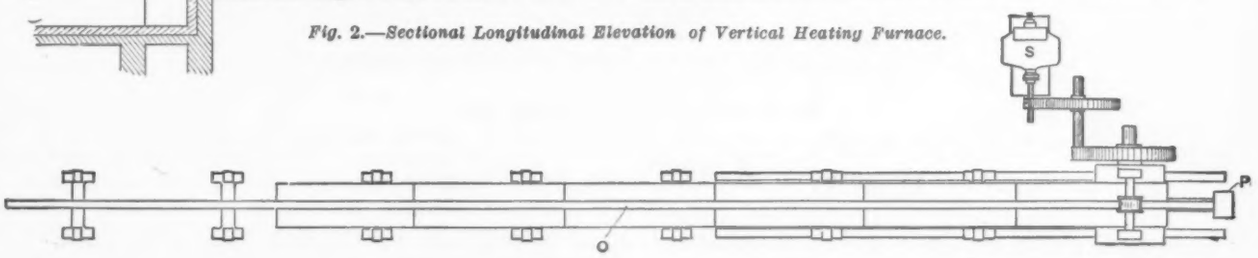


Fig. 3.—Plan Electrical Pusher.

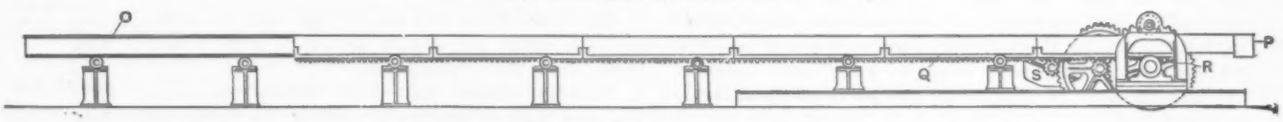


Fig. 4.—Elevation Electrical Pusher.

AN IMPROVED TYPE OF INGOT HEATING FURNACE.

As previously noted, in an arrangement of this sort the ingots are charged and discharged from the top, the operation necessitating the removal of the cover of the pit every time an ingot is introduced or removed. A great amount of heat is therefore allowed to go to waste during this interval.

Horizontal Heating Furnace.

Next in the order of development comes the horizontal heating furnace. This consists of a long narrow pas-

* Abstract of paper presented at the Milwaukee meeting of the American Society of Mechanical Engineers.

sage with a bridge and combustion chamber at one end, the other end being open and provided with a sliding door. This furnace may be direct fired, or may use gas furnished from an outside source, as desired. Into the open end of this furnace the ingots, after being turned to a horizontal position, are pushed, one by one, generally by means of a hydraulic apparatus. As they approach the combustion chamber they gradually become heated to the required temperature. Here they are removed through a cover in the top of the furnace. To facilitate the pushing operation the furnace is provided with two water pipes laid longitudinally in the bottom on which the ingots rest during their passage.

This furnace is compact, and, comparatively speaking, may be cheaply constructed and maintained. It possesses, however, certain disadvantages. First, if the ingot is not entirely solidified inside, upon turning it down to a horizontal position the molten metal may break through the thin crust at the top and run out. Second, while passing through the furnace the ingots are of necessity packed closely together side by side; consequently the upper side alone is subjected to the direct heat of the burning gases. On the other hand, if the ingots approaching the fire box become welded together on account of excessive heat, as sometimes happens through careless heating, they are particularly difficult to separate.

A consideration of the inherent defects of the two methods of heating ingots just outlined has led to the development and construction of the vertical heating furnace, and later to its most recent adjunct, the electrical pusher. To describe this latest type of furnace in detail and to disclose its method of operation is the specific purpose of this paper.

Vertical Heating Furnace.

In the accompanying cuts Figs. 1 and 2 show respectively a semisectional plan and a sectional elevation of the furnace as arranged for direct firing. Figs. 3 and 4 show plan and elevation of electrical pusher. Fig. 5 shows an elevation of the charging end, and Fig. 6 a semisectional elevation of the firing end. The paper shows drawings also of the furnace as arranged for firing with gas from an outside source.

The main body and the combustion chambers of the furnace are constructed of fire brick, as is usual. Raised from the floor of the furnace, which, as may be noticed from Fig. 2, slopes gradually from each end toward the opening A, is a fire brick wall. The latter carries a heavy wrought iron pipe, B, in which water is continually circulating. Two pipes may be used so as to give more of an incline to the ingots if deemed necessary. At the firing end of the furnace is a pit, C, filled with sand, which produces a fluid and free running slag, serving also as a hotbed for the removal of cold spot on base of ingot due to contact with pipe B.

In the side walls of the furnace the pipes D D are introduced, as shown. These are inserted in sections, ends of which are firmly clamped outside of furnace, so as to secure a rigid support for ingots which lean against them, as later described.

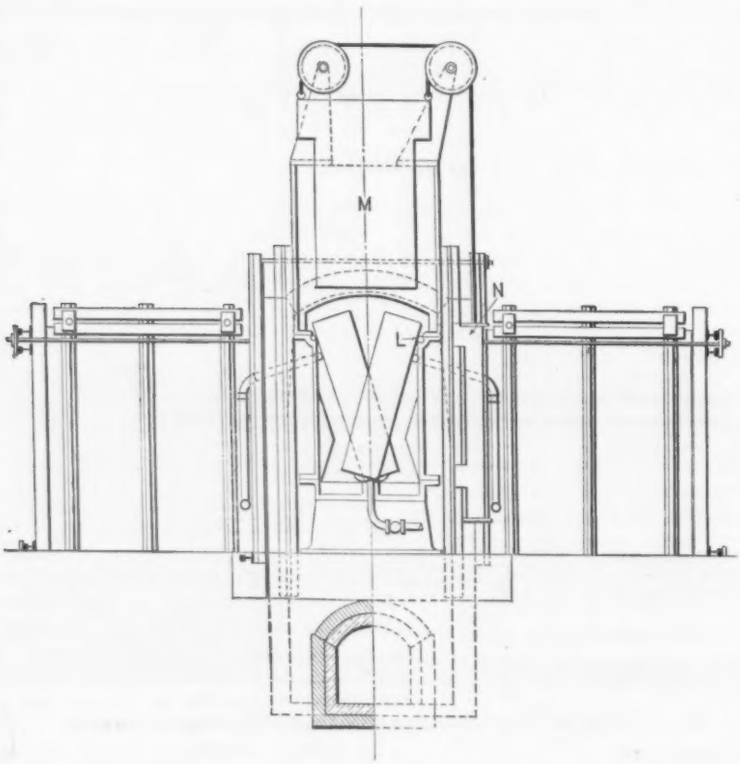


Fig. 5.—Elevation of the Charging End.

AN IMPROVED TYPE OF INGOT HEATING FURNACE.

At the firing end of the furnace a pipe, F, is let into the wall, as shown, to serve as a support for an ingot about to be withdrawn.

The type of fire box and bridge and the arrangement of blast pipes are clearly shown in Figs. 2 and 5 and need no further explanation.

Directly above the point where the ingot, having been pushed gradually toward the firing end, must finally rest, is placed a cover, G. As will be noted on the drawings, this cover carried on the truck H, rolling on the rails T, is inclined to the plane of motion, thereby obviating the necessity of lifting before uncovering the opening, as is the usual pit practice. The operation of opening and closing the cover is performed by means of the pneumatic cylinder I, the piston rod of which is directly attached to the cover, as depicted in Fig. 2.

The charging end of the furnace is provided with projecting castings, J K, Figs. 2 and 5, serving the purpose of a receiver in which ingots are placed in proper position before entering the furnace. The upper casting J carries a pair of brackets and rope sheaves; over these pass wire ropes from which is suspended the door M, operated rapidly by means of the air cylinder N.

The gases escape through the flues Y Y, which are so arranged that the draft will be equal on both sides of furnace. If desired these flues may contain devices for heating the air blast.

Electric Pusher.

The most interesting and novel feature in connection with the operation of the furnace is the pusher, Figs. 3 and 4. In previous arrangements hydraulic pushers have been used; these are, however, open to several serious objections. It has been found impracticable to construct a single stroke pusher of sufficient length to charge a furnace of this type, and as with the multiple stroke pusher the length of the stroke is limited, it is necessary when running the pushing head far into the furnace to take a number of successive hitches—that is, the plunger after making a stroke must be run back and a fresh hold taken on the pushing bar by means of a clutch. The process is consequently very slow and the door of the furnace must remain open a long time. With the high pressure necessary for handling large ingots, say 12 x 12 and above, considerable trouble is experienced in keeping the hydraulic connections tight and in good repair. The pushers are also generally in exposed positions, and unless carefully protected trouble is liable to be met with in cold weather. In brief, the hydraulic type of charger has been found inadequate to furnaces of this length owing to its inherent weaknesses—viz.: lack of speed and danger of breakage due to water hammer under high pressure.

To obviate these difficulties an electrical pusher has been devised. This consists essentially of a long I beam, O, running upon rollers, as shown, and provided with a cast steel pushing head, P. On the lower portion of the I beam is bolted in section a cast steel rack, Q, the teeth of which engage with those of the pinion R, the latter being driven through a train of gears by the motor S. The latter is a series motor of the railway type, and is arranged for the ordinary system of series-multiple control. The speed of the pusher may consequently be varied over as wide limits as desired, this feature being particularly desirable in rapidly withdrawing the ram from the furnace. Considered from an economical point of view the electrically driven charger is pre-eminently adapted to the purpose, as the output of power necessary is in direct proportion to the effective work done. An auxiliary motor may be connected direct with the main driving gear, or independent on the pusher rack, Q.

Operation.

Briefly described the operation of the furnace is as follows: The ingots one by one are placed by the charging crane so that they stand on the pipe B, the upper part resting against the rod L, as shown in Fig. 5. They are alternately inclined to the right and left, as indicated in the same figure. As fast as they are placed in position the door M is raised and the ingots are pushed into the furnace. As the heat increases gradually toward the firing end, they reach the proper temperature as they approach the latter place. When the ingot reaches the incline part of the pipe B it slides down and rests on sand bottom, C, the upper part leaning against the pipe F, which locates the ingot in correct position for withdrawing. The cover G is then opened and the ingot, which is now ready for the rolls, is extracted in the ordinary manner. It will be noted that slag holes are provided on each side, as shown at U, and also at the end, as shown at V, the floor of the furnace being graded accordingly.

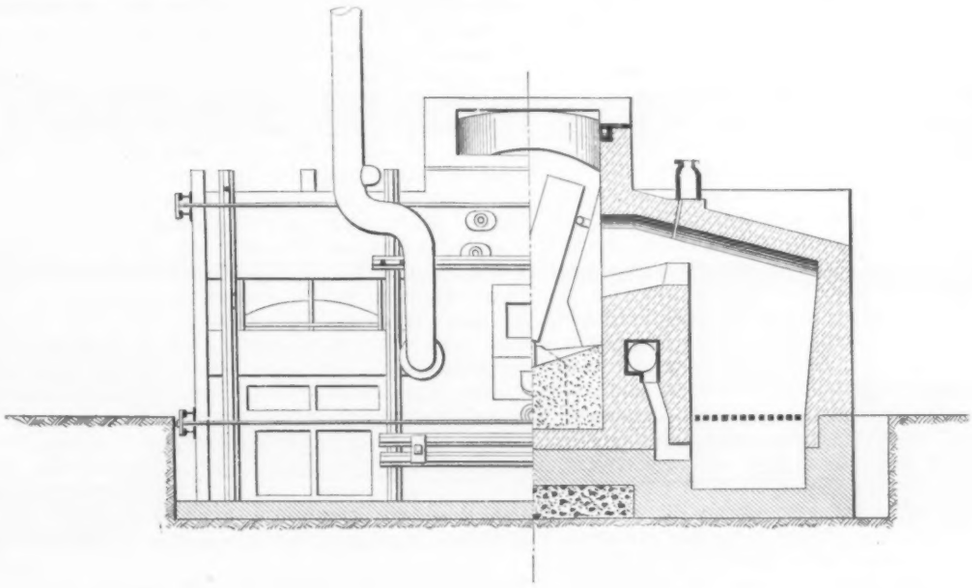


Fig. 6.—Sectional Elevation of Firing End.

AN IMPROVED TYPE OF INGOT HEATING FURNACE.

This furnace, as equipped, possesses a number of commendable features.

Advantages.

1. Comparatively low first cost of installation.

2. Considering the storage and heating capacity of this furnace, it occupies relatively a small floor place, besides being easily and quickly erected.

3. Owing to the simplicity and accessibility of parts, the cost of repair and maintenance is reduced to a minimum.

4. In the continuous furnace, especially the type which forms the subject of this paper, in which the ingots are alternately inclined to the right and left, coupled with the continuous method of charging, a much better opportunity is given for an even heating on their sides, and in this respect the vertical furnace surpasses the horizontal and closely approaches the soaking pit; the even heating of ingots being one of the strongest arguments in favor of the latter.

5. There is at all times a maximum amount of metal in the hottest region of the furnace, which is not true of any other type of ingot heating furnace.

6. If, as often happens, it becomes necessary to charge cold ingots, the superiority of the vertical continuous heating furnace over all other forms is very marked, for its length is such that, after traversing say half the length of hearth, it is safe to say the temperature of the

flame is about the same as when leaving the regenerative chambers of soaking pits. As a result, heat which escapes in the latter case is doing effective work in continuous furnace preheating cold metal.

7. As a consequence of the gradual decrease of temperature toward the charging door, cold ingots may be introduced into furnace without danger of cracking, thus giving to this type of furnace a decided advantage over the soaking pit form in the treatment of high carbon steels.

8. The temperature of the burning gases decreases gradually from the firing toward the charging end, until, at the latter end, they are comparatively cool. Thus the opening of the charging door does not result in great loss of available heat, as in the case of the soaking pit.

9. On account of the high speed of the pusher the door is kept open a comparatively short time, and the pusher itself is only briefly subjected to the intense heat.

10. The ingot is handled in a vertical position from the time it leaves the steel mill until it is delivered to the mill tables. No high pressure water is required in connection with this furnace, as air cylinders are found entirely satisfactory for operating the necessary doors and covers. Troubles incident to cold weather and maintenance of such a system are thus avoided.

11. Owing to the method of applying the heat, it has been demonstrated in practice that the furnace waste and oxidation, or scale formation, is very much less in the vertical furnace than in the ordinary soaking pits.

12. Another advantage over the soaking pit practice is that segregation is greatly reduced, because in charging hot ingots the low temperature in the rear end of the furnace gives the inside core of the ingot a chance to solidify without losing the benefit of the initial heat in the ingot; and, furthermore, cold ingots that are already solidified can be charged in this furnace with greater economy, owing to the feature mentioned in paragraph 6.

In conclusion, while this system of heating is advantageous in large plants it seems to the writer to be especially adaptable to smaller plants producing from 100 to 200 tons of steel per day. In other words, for small size plants it seems apparent that a soaking pit arrangement would be comparatively very expensive.

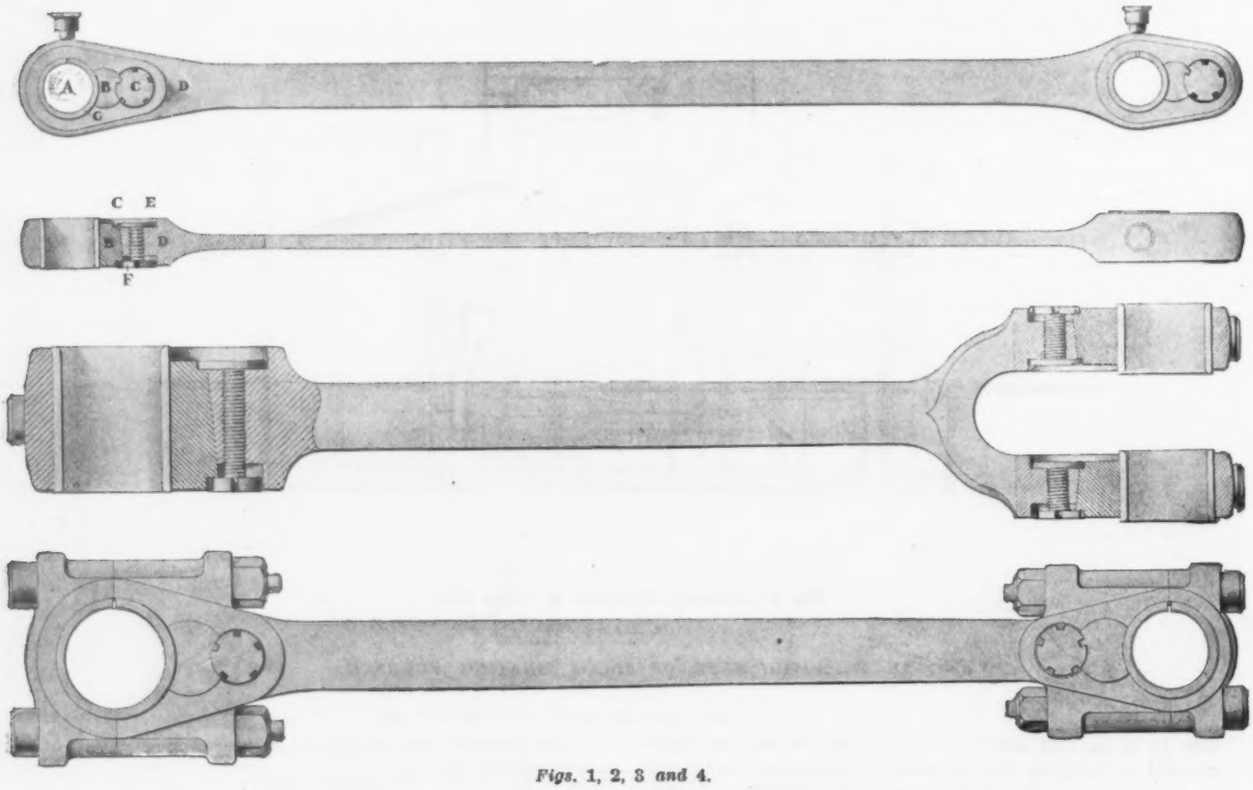
A New Connecting Rod End.*

BY C. W. HUNT, NEW YORK CITY.

The adjustable bearings in a connecting rod are the most troublesome to fit up of any used in steam machinery. The stresses alternate so rapidly that any looseness in the parts of the bearings is followed by such violent shocks to the mechanism that the most rigid construction is required to prevent serious injury.

The method of construction, necessarily used from the peculiarities of the ordinary designs, requires the work to be done on slotting, shaping, or other machines that must be manipulated by a skillful workman. These machines are not fitted to do rapid or duplicate work, nor is it convenient or even possible in many cases to obtain workmen having the requisite skill to make a bearing with the accuracy that the maker sets up for his standard.

In an effort to make a design which will require less minute measurements and highly trained personal skill, I have arranged the method of taking up the wear in a connecting rod or other bearing which is illustrated in the cuts herewith shown. The work is done on machines which, with ordinary attendance, lend themselves admirably to duplicate work and accurate results.



Figs. 1, 2, 3 *and* 4.

A NEW CONNECTING ROD END.

The sides of the rod are planed off, and the ends turned or milled to bring the exterior to the finished shape shown in Fig. 1, or bolted rigidly together in Fig. 4.

A hole for the wedge B is then drilled and reamed at an inclination with the axis of the crank pin of about one in ten. In this hole the cylindrical plug B is inserted. It is made an easy sliding fit, but is temporarily held fast during the following manipulations by a wedge key, or other means, while the hole for the crank pin bushing G is bored at right angles to the axis of the rod. Both holes are cylindrical, but their angle to each other makes B a wedge, convex on the rod side and concave on the bearing side. The holding

*Paper presented at the Milwaukee meeting of the American Society of Mechanical Engineers.

key is now removed, and B is free to move any distance in the direction of its axis, but if it is moved endwise it will throw the concave side toward or from the crank pin A. To adjust and hold B in position a screw C is fitted with two collars to embrace the ends of the wedge. This screw may be fitted wrench tight to hold it securely in any position, or it may be held by other means in large bearings.

To illustrate the delicacy of adjustment we may assume that the axis of B is at an inclination to the crank pin of one in ten, the screw C cut with 20 threads to the inch, and the head slotted with five notches 72 degrees apart, then the revolution of the screw C one notch will move B 1-100 inch axially and adjust the bearing toward or from the crank pin 1-1000 inch.

The rigidity, accuracy and delicacy of adjustment of this bearing are shown in the marine form of rod, Fig. 3. The bolts of the cap are drawn up tight and locked, thus holding the cap and the rod metal to metal, making it in effect as rigid as a solid end rod. The adjustment of the bearing is then made as frequently and as delicately as desired. For large marine engines, mechanism for working the adjustment could be carried to a point near the cross head, so that the bearings of both the crank pin and the cross head pin could be adjusted with the greatest facility even while the engine is in motion. The more massive the rod the greater are the advantages of a rigidity that does not affect the ease and delicacy of adjustment.

The end pressure on B from the load is the resultant of the angle of inclination used less the sum of the frictions on the two opposite surfaces of the wedge. Proportions can be used that will result in a practical equilibrium so far as the end motion of B is concerned.

Fig. 1 shows the application of the adustment to an ordinary valve rod in which the adustable parts are placed in the rod in such a manner as to have the wear of the bearings affect the center to center length the least possible. The variation is here the difference in the wear of the two bearings instead of the sum of their variations, as is the case in the usual arrangement of the adjustments.

The very rigid form of this bearing, together with its delicate and accurate adjustment, makes it suitable for minute adjustments required in stamping presses.

It will be noticed that the adjustment of the bearing is a parallel motion with large bearing areas, accurate surfaces, and little or no tendency to get out of adjustment, either from long use or faulty manipulation. The delicacy of the adjustment, the mechanical accuracy of the bearing, and the decrease in the cost of manufacture over the ordinary designs will be evident to shop men. The bushing is of the best form for securing accuracy of form combined with economic manufacture. The bushings can be renewed at a comparatively small expense, when the original length of the rod will be exactly restored.

The Pressed Steel Car Company of Pittsburgh are in receipt of an order from the Chesapeake & Ohio Railroad for 400 hopper coal cars, and one from the Algoma Central Railway Company of Ontario, Canada, for 50 hopper cars. The cars to be built for the Chesapeake road are similar to the 600 cars built by the Pittsburgh concern a few months ago. The distinguishing feature of this style of car is its carrying capacity as compared to its weight. A car weighs but 38,200 pounds, yet is able to carry 112,000 pounds of bituminous coal. The cars for the Algoma Company will be counterparts of the same 100 cars built by the Pressed Steel Company for the same road some time ago. The weight of each car will be 29,400 pounds, and its carrying capacity 100,000 pounds.

For several months the Carnegie Steel Company have had under erection at Lucy furnaces, in Pittsburgh, a refrigerating plant. The idea of this is to deprive the ore of a large percentage of moisture, precipitating and freezing the water before the blast is sent into the furnace. The process is a purely experimental one and its success has yet to be determined.

Blue Printing by Electric Light.*

BY H. G. REIST, SCHENECTADY, N. Y.

In large manufacturing establishments the short and frequently dark and cloudy days of winter are the occasion of great inconvenience and delay in the production of blue prints. A printing plant suitable for making the required number of prints in summer will be entirely inadequate for the same production in winter. Unfortunately, this is a department which ordinarily cannot be worked overtime in order to make up for the loss. Suffering much on this account because of the large number of blue prints required, the General Electric Company some time ago tried several methods of printing by electric light. In one plan a small room was arranged with nine arc lamps placed about 18 inches apart, suspended from the ceiling, and by a suitable arrangement of reflectors a large portion of the light was thrown downward on printing frames arranged on trucks, being the same frames which are used ordinarily for printing by sunlight. The reflectors are hinged so that the light may be thrown to the position wanted. With a rapid printing paper the time required for printing with this arrangement is from six to eight minutes.

Another arrangement for printing and one which is being used extensively with somewhat more satisfactory results, is shown in the accompanying illustration. It will be seen that there are two lamps, each being a standard 5-ampere 110 volts inclosed arc lamp, inclosed by a metal hood a little larger in size than the printing frame. The hood is strongly constructed of sheet iron with parabolic sides, which are finished on the inside with white enamel, having good reflecting power. The hood is supported on the lamps, and in order to prevent the parts from overheating an effective ventilating device is provided at the top. There are also handles on the side so that it may conveniently be moved along the track. The lamps in turn are supported on a small trolley arrangement, made from the parts used for sliding folding doors, and on each side there is a conducting wire from which a small trolley wheel carries the current to the lamps. The tracks on which the lighting device is supported are of sufficient length so that five printing frames can be set under each of them, and the lamps readily moved to cover any one of them. The printing frames which we are now using are the standard frames used for sun printing, although they can be somewhat simplified if they are made specially for printing by electric light. The lamps are inclosed in white opal globes. This diffuses the light and the white interior of the reflector projects it downward so that the area over the print to be made is very uniformly lighted, there being no perceptible difference in the tone of the print in the middle from what it is in the corners. When the first print has been exposed a sufficient length of time the light and the hood are moved along the track to the next frame, while work is begun on the first one to replace the printing paper or tracing, as the case may be.

The time required for printing naturally varies widely with different tracings and different makes of paper. In general, it may be stated that the time required is three or four times as long as with bright sunlight. With one grade of paper which we are using, the time by sunlight in the middle of the day during February is about 35 seconds, and by electric light 1½ minutes. It will readily be seen that there are great advantages in having a printing establishment which is independent of the season or of the condition of the weather. With an electric equipment blue prints may be put into the factory almost immeditely after the completion of the tracing, regardless of the time of day.

In summer it is possible to print all the time during office hours, and the percentage of time lost on account of cloudy and rainy weather is small. In winter it is not practical to print after about 4 o'clock in the afternoon, and the amount of bad weather is a large part of the to-

*Abstract of paper presented at the Milwaukee meeting of the American Society of Mechanical Engineers.

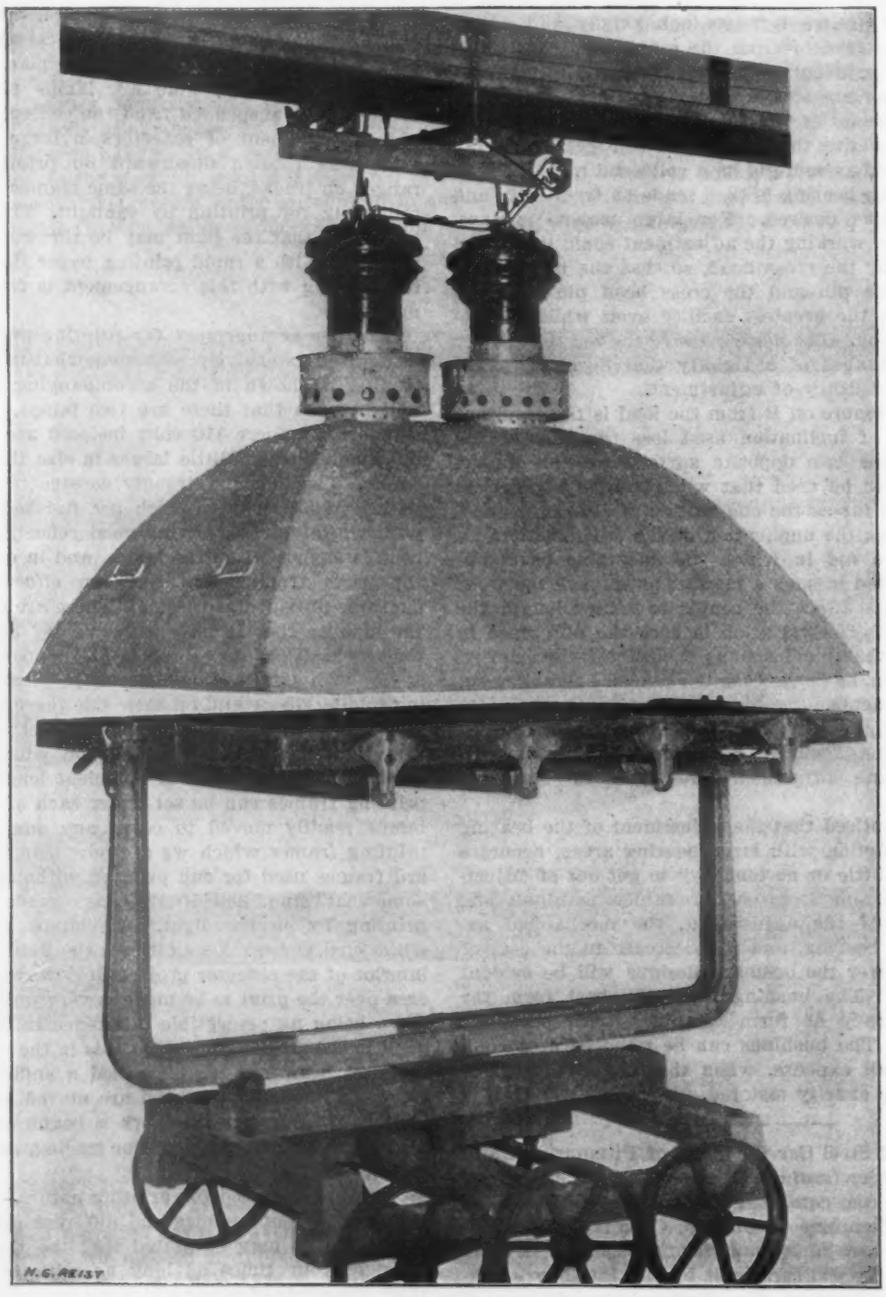
tal time. In the belt in which I live it is cloudy as much as 60 per cent. of the time during the months of December and January. In cloudy weather the time required for printing is about eight to ten times as great as on a clear day, and on a rainy day it is not possible to print at all out of doors, except by a specially devised waterproof printing frame; but at such times the time required for changing prints is greatly increased, as the frame has to be wiped to keep from injuring the tracing.

From curves of the actinic value of sunlight for different times of the day and for different seasons, I have calculated that with a paper so rapid that it will print in 8 seconds in the sun at noon during the month of July, the mean time required for making a print in January for the hours from 8 to 12 and from 1 to 4 is 2.33 minutes. Similarly, in July the mean time for the hours above, except that the time is extended to 5.30 in the afternoon, is 0.59 minute, or the mean time for clear days during the year is 1.40 minutes.

Taking all the above into account, I find that the average number of prints made by one operator in winter per day is 26.4. In summer the number of cloudy days is about 25 per cent., and the average number of prints that may be made by one operator is 57.3, or more than twice as many as can be made in winter.

The cost of making prints by electric light is much smaller than one would expect, and the following figures indicate that it is cheaper to use artificial light than sunlight for this purpose.

In printing by electric light it is assumed that the cost of electricity is 12 cents per kilowatt hour, which I believe is a fair commercial rate. The lamps are turned off when not in use. They are in use only 85 minutes for each operator, as shown in the table below. Each lamp requires 550 watts and the cost is 18.7 cents per day.



BLUE PRINTING BY ELECTRIC LIGHT.

Labor is assumed at the rate of $1 per day.

	Sunlight.	Electric light.
Number of prints per day, mean per year	41.9	56.5
Cost of printing, per print.....	2.39 cents.	2.09 cents.

The time required for changing a print in sunlight is a little longer than when artificial light is used, because the whole frame has generally to be moved, and the frame has to be adjusted to the proper angle to get the most effective sunlight. The time allowed for changing prints is 7 minutes when printing by electric light; 8 minutes when printing by sun, while when printing during a rainy day as much as 20 minutes may be required.

The Iron Age

New York, Thursday, June 6, 1901.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - BUSINESS MANAGER.

The Machinists' Strike.

The events of the past week have cleared the atmosphere, so far as the manufacturers are concerned. All doubt as to what action they might take has been dispelled by the declaration of principles adopted by the Administrative Council of the National Metal Trades Association at their special meeting in Chicago. The tone of this declaration is significant. Its phraseology is clear cut, and instead of dealing in generalities it forms a bill of particulars, specifying unequivocally the position taken with respect to all matters connected with the administration of the operating departments of the shops. Such a strong declaration could not have been issued by any body of men unless they felt that forces were being arrayed against them which were operating to their serious disadvantage. It must be borne in mind that this declaration was not the outcome of an exclusive meeting of the Administrative Council. Prior to drafting it they had conferred with representatives of manufacturers' organizations from a number of cities in various parts of the country, these organizations comprising a membership including many not identified with the National Metal Trades Association. At this conference the interchange of experiences had shown that the foothold gained in the shops by the union, under the operation of the New York agreement, had resulted in the introduction of practices by the workmen which were subversive of discipline and detrimental to the interests of employers. Production had been curtailed and all indications pointed strongly to the systematic restriction of output and the elimination of handy men as the shops became more perfectly under the control of the union. These facts being made clear at the conference, a determination to free themselves absolutely from union control grew with irresistible strength. Thus the strike by the machinists to secure ten hours' pay for nine hours' work has been productive of vastly more important results than had been anticipated. Instead of acting on the defensive, the manufacturers have assumed the aggressive.

The action taken by the National Metal Trades Association has had another important result. Many manufacturers had persistently refused to join the association because of its formal recognition of the union, to which they were strenuously opposed. Immediately upon the adoption of the declaration of principles they either applied for membership in the association or announced their determination to co-operate in securing the independence of the shops. Thus the International Association of Machinists will now have a much more formidable body of manufacturers arrayed against them than if they were merely fighting the National Metal Trades Association. It is observed that no pronouncement has been made against the union, and it is therefore assumed that the manufacturers will not attempt to break up the workmen's organization by refusing to employ union men, but their shops will be open to union or non-union workmen as in times past. In this they are far more liberal than the International Association of Machinists, who are seeking to prevent the employment of non-union workmen.

It is a pleasure to note that the manufacturers in taking an aggressive stand have not utterly ignored conciliatory methods in the future management of their affairs. They specifically recognize the desirability of arbitrating any disagreements relative to matters which do not involve the government or management of their shops. The question of a proper rate of wages, we take it, will be a suitable subject for arbitration. But it is laid down as a governing principle that the workmen must not strike while the decision of an arbitration is pending.

The keynote of the new alignment of employers in the machinery trade comes from Milwaukee. That city, as the residence of the president of the National Metal Trades Association and the seat of one of the strongest local associations of manufacturers, assumes peculiar prominence in this struggle. The Milwaukee manufacturers have adopted a set of rules for the government of their shops which have been very carefully considered and will, it is expected, provide a plan for the manufacturers of other cities to follow in opening their shops for the re-employment of their men. These rules are published elsewhere.

In conclusion, the fact may be stated that the labor leaders who base their hopes of an early surrender by the employers because all important shops have large contracts booked are relying upon a condition which is not new and will not be permitted to have any influence. The manufacturers feel that now they are contending for a vital principle in the conduct of their establishments and that it would be useless to wait for a more favorable opportunity. In the very nature of their business they are always working on contracts, and they are as likely to incur losses in the future as at present if the contest should be deferred. It is to be hoped that it may be of brief duration.

American Locomotives and Bridges in English Colonies.

The cable reports some of the features of a controversy between Lord George Hamilton, the Secretary of State for India, and Sir Alfred Hickman, a member of Parliament and a conspicuous figure in the English iron trade. The utterances of the latter ever since American competition has become a factor have been characteristic of that type of narrow Englishmen who have been chiefly responsible for placing Great Britain in the plight in which she now finds herself. While many progressive English manufacturers have availed themselves fully of the opportunities freely offered to study our resources and our methods, he and those like him have denied the facts without studying the situation, have sought every opportunity to belittle what Americans have accomplished, have found fault with the products, and when ultimately driven into a corner have fallen back on the comforting conclusion that the foolish and wicked tariff was responsible for everything.

This whole American scare in Europe has been a splendid advertisement for the manufacturers of the United States, a country which was to many buyers all over the world, till recently, a very shadowy geographical term. We ought, we suppose, to be grateful to Sir Alfred Hickman for having drawn from the Indian secretary a tribute to American products like that contained in the following passage from his official reply:

"No practical engineer who has visited American workshops and inspected their methods of production

and manufacture would for a moment indorse your assumptions. Their competition is dangerous because they are yearly improving their products, both in quality and price. It always has been the practice of the boards of management of the Indian railroads to give preference in all their contracts to British manufacturers, and that policy has so prevailed that up to the great recent engineering strike no order for a railway locomotive was ever given outside of Great Britain. Since then, owing to the British workshops being blocked with work, certain of the Indian railway boards found it necessary, as locomotives could not be obtained here, to place a few limited orders in America. I am ready to give all the available reports concerning working, consumption of fuel and load drawing power of these locomotives. The earlier reports were unfavorable; but, when their working was better understood and alterations were made to suit the local fuel, a marked improvement was noticed, so much so that one company wishes to obtain more engines of similar construction. That American locomotives obtained a footing in India was due to the strike I have referred to. But if, as I hope, British locomotives are in the future to regain their monopoly in that vast system of railways, British engineers must profit by the hints and suggestions these reports convey."

In the case of the Gogteik viaduct, in Burmah, the charge was made that the riveting was defective. Lord George Hamilton replies that that charge was in no way supported by a searching inspection. He continues:

"You seem to think that orders have only gone abroad because those who gave them did not understand their business. I wish it were so. The competition we have to face is founded on something much more formidable and more substantial. Chemical research, the concentration of capital, thorough technical education and improved industrial organization have made in recent years a greater advance in America than here. It is with the product of these combinations and not with the assumed stupidity of the Indian officials that the British engineer has to contend. So far as I am concerned I can undertake that preference, unless the difference in price, quality and delivery is very substantial, will always be given to British firms. May I not ask you, as a leading member of the great steel industry of this country, to co-operate with me by impressing on your associates the necessity of meeting competition in the future, so as to insure that price and time of delivery will be on the side of British production?"

No American will complain when English manufacturers are given the preference on orders originating in their own country, particularly when they involve the expenditure of public moneys. That is a practice in all countries and in our own as well. In fact we know of instances in which private parties have thrown out all bids because there was no other way of ignoring the figures of American firms.

But it is a little absurd to claim that the manufacturers of a country which can boast of so large a percentage of the total railroad mileage of the world cannot produce satisfactory locomotives or build safe bridges. In fact our practice has carried us further, and demands more accurate work. No engineer in this country thinks of demanding that a bridge be actually erected at the shops before the material is shipped, just to see that everything fits. And yet that is what was at first insisted upon in the case of the Gogteik viaduct, and it was only after a tour of inspection in this country of one of the English engineers that this requirement was waived.

After a protracted period of skepticism as to the ability of American producers to market iron in Great Britain, our English friends seem to have fallen into the habit of excessive credulity. The latest scare is that created by the imports into Great Britain of pig iron from Cape Breton. With two blast furnaces running at a moderate rate and two more likely to blow in, Great Britain is to be swamped by the Dominion Iron & Steel Company. Quantities are talked of which are out of all proportion to the real capacity of the plant, and the fact is forgotten that, after all, the appearance of the company in the foundry iron market is merely temporary. As soon as the steel plant is completed the greater part of the tonnage will be required for that department, and later on, when the rail mill, now being contracted for, is running, it will take the whole output of the blast furnaces to keep the works even partially busy.

Wireless Telegraphy in the Navy.

Admiral Bradford, Chief of the Naval Bureau of Equipment, has given out the following extract from the report of the board which has investigated the question of transmitting messages by wireless telegraphy:

From the examination of the subject as outlined in the orders of the Department the board makes the following recommendations:

1. That the use of homing pigeons be discontinued as soon as wireless telegraphy is introduced into the navy.

2. That, pending such action, no new pigeon cotes be established.

3. That wireless telegraphy be adopted by the navy for transmission of messages between distant points.

Referring to the last recommendation, the board is of the opinion that a high degree of special electrical training is demanded for the successful operation of any system of wireless telegraphy, and it therefore suggests as necessary the establishment of two stations sufficiently far removed from each other for the training of officers and men. In its opinion this requirement would be best met by the establishment of such stations at the Navy Yard, Washington, and the Naval Academy, Annapolis.

If wireless telegraphy fulfils what now seems to be its possibilities, the cadets should be thoroughly trained in it.

As the investigation made by this board is not technical, there being no apparatus of any kind ready for test, but general in its character, such partial examinations as outlined above would not change the recommendations already made.

The selection of any special system of wireless telegraphy is, in the opinion of the board, very largely a matter of business detail.

If, for any reason, any competitive test of different systems is thought desirable, the board recommends, in view of the fact that the improved Marconi apparati will not be available for several months, and that improvements in any other systems may occur in that interval, that it be made only after due notice and preparation therefor, and by a special board of experts appointed for the purpose.

After holding three conferences the Massachusetts Board of Arbitration and Conciliation has succeeded in bringing about a settlement of the strike of the forgers employed by the Bay State Cutlery Company at Northampton, Mass. The men will work at the old schedule until October 1, after which date they will work nine hours per day at the same wages they have been receiving for a ten-hour day.

In a report to the State Department, United States Consul Tourgee at Bordeaux, France, says that the fastest time made by any railway is on the road between that city and Bayonne, where a run of 123 miles is made every day in 128 minutes. It is quite to the credit of American mechanics, he adds, that the honor of making this run is accorded to American locomotives.

American Foundrymen's Association.

BUFFALO CONVENTION.

The American Foundrymen's Association assembled at Buffalo on Tuesday in their sixth annual convention. There were more than 200 names on the register at the opening of the convention. The Buffalo Foundrymen's Association made every effort to entertain the delegates in royal style and they succeeded.

TUESDAY MORNING.

There were about 100 foundrymen present when President W. A. Jones of the W. A. Jones Foundry & Machine Company of Chicago called the convention to order. He introduced O. P. Letchworth of Pratt & Letchworth of Buffalo, who delivered the address of welcome. Mr. Letchworth did not come before the foundrymen as a stranger, for his close affiliation with the National Founders' Association has made him a familiar figure wherever matters pertaining to foundry practice are concerned. President Jones introduced Mr. Letchworth as the president of the Buffalo Merchants' Exchange. In his remarks Mr. Letchworth expressed the regrets of Mayor Diehl upon his inability to be present. In behalf of the Buffalo Merchants' Exchange and the Buffalo Board of Trade, as well as in the name of the Mayor of the city, Mr. Letchworth welcomed the delegates in a most appropriate speech. In course of his remarks he said: "It is greatly to be deplored that at this particular time the relations between capital and labor in many lines of trade are somewhat strained. I have great faith, however, and I am very confident also that the future has better things in store for us. I have great confidence in the belief that the more intelligent and conservative representatives of labor appreciate the gravity of the situation and that they are anxious and desirous to take such steps as may possibly prevent more strained and more difficult relations than now exist. I also have great faith and great confidence in the forbearance, intelligence, the charity, the good sense and the level headedness of the business men of this country."

C. S. Bell of the C. S. Bell Company of Hillsboro, Ohio, responded to the remarks of Mr. Letchworth in behalf of the association.

President's Report.

President Jones then read his report for the year, which was heartily received by the delegates. It was in part as follows:

Our association is no longer an experiment, it is an educational institution whose influence is felt not only in this country, but its papers are eagerly sought for and read by our brothers across the water.

Its journals are to-day just what the busy foundrymen have wanted for years, a practical review of reviews of the current foundry literature of the country, the extract of that portion of our trade journals touching foundry interests, brought together in such shape that it commends itself to all. It is an institution which I regret very much to state does not receive that hearty support to which it is so justly entitled, but this I am led to believe is because its value is yet unknown to the most of us, a fault which will soon be remedied, I trust.

There is one thing I want to call your attention to and trust that you will give it your serious consideration. I refer to the great good which has been accomplished by the National Founders' Association, and its sister organization, that of the National Metal Workers' Association.

I do not propose to go into details as to the merits of these organizations, but I do not hesitate to make the broad statement that those of you who are conducting a manufacturing business will learn, and that, too, in the very near future, that you cannot well get along without them, and the influence they exert. These organizations are not aggressive, but progressive; they are the great medium by which we are brought in direct touch with the better element of organized labor.

Labor organizations can only be successfully dealt with by the organized interest of the employer, and the two associations referred to are recognized, not as an enemy in camp, but an avenue to the amicable settlement of the difficulties that are bound to arise, and that, too, without the introduction of that relic of barbarism, the strike and the lockout. As an evidence of this I have only to cite to you the experience of the Stove Founders' Defense Association, who have not had a single strike for a period of ten years or over.

Secretary's Report.

The secretary, Dr. Richard Moldenke, reported in part as follows:

In accordance with the resolution concerning the better training of our future foundry managers, passed at the last convention, your secretary begs to report that this matter was taken up by correspondence with practically all our institutions of learning which devoted some attention to technical education. With only one exception replies were received, and these indicated the serious thought given to the problem. Indeed, the establishment of a department for foundry theory and practice has been strongly recommended in the case of the Carnegie Technical School. A very extended series of letters was the result, for many of our universities wished to know in what way they could aid our industry. The consensus of opinion seems to be that pending special equipment for the purpose instruction should be given in foundry practice by lecture and regular visits to the more advanced foundries of the respective districts. Summer classes should be formed for the students who wish to make this their life work, or they should become volunteers in order to learn what they can of the practical operations of foundry procedure. Once the foundry becomes the desirable field for technical students it should, and the institutions for learning are enabled to add foundry apparatus to their equipment, plenty of use will be found for it, not only for teaching the various branches of the industry, but for advanced investigation, and consequent benefit to the students as well as ourselves. We sincerely hope this agitation in teaching circles may go on, and feel that as our requirements become better known thereby the solutions will suggest themselves in the natural course of events.

The relation of our association with the local bodies of foundrymen has been most pleasant. Papers have been furnished to the Pittsburgh, Philadelphia, New England, Milwaukee and St. Paul and Minneapolis foundrymen's associations regularly, and it is to be hoped that our association may eventually reap some benefit by way of increased membership therefrom, in return for the effort and expense entailed in the collection and distribution of nine papers in editions of 250 copies each, in addition to the regular work of the association throughout the year.

In obedience to a request for information relative to the melting loss in the cupola process, your secretary distributed suitable blank sheets of inquiry and is still receiving returns. The amount of interest created is most gratifying, replies having come even from Europe, and those of our foundrymen who still wish to help obtain this information of such importance to the trade are requested to communicate with the secretary. It is hoped that a synopsis and study of these memoranda can be presented early in the fall.

From the numerous requests for specifications for gray iron castings received during the year, from the operating departments of great industrial corporations, the action which will be taken on the report of our Committee on Standardizing the Testing of Cast Iron will be observed with much interest. Indeed, the magnitude of

our industry is such that the wish has been repeatedly expressed that our association should take up this question seriously with the International Association for testing materials at the coming convention in Buda-Pesth, acting through the American Section, of which we are members.

Report of Standardizing Bureau.

The following report was made by Thos. D. West, chairman of the bureau:

Your committee is happy to report that the benefits derived from the use of the association's standardized drillings in about 200 laboratories of this country and Europe are being widely recognized and that they are commended wherever used. This more especially for the aid these drillings have given in bringing about a greater measure of confidence in the analysis of furnace and foundry products.

The demand for the association's standards has been so great that it was found necessary to prepare a second allotment of sample A last January.

The following is the statement of the financial and manufacturing accounts to May 20, 1901:

Total expenses to date	$609.97
Collections to date	954.90
Bills receivable	24.99
Inventory of drillings	222¾ lbs.

While the association's standardized drillings have served their end in a most valuable way, there still remains other work in the same direction, and the time seems now ripe for some definite action on the next step. We refer to the instructions received by your committee at the Pittsburgh convention, two years ago, to learn if anything might be done toward the specification of uniform methods in making chemical determinations. This matter was taken up at that time and has been more or less continually agitated by your committee, but action was postponed in order to let the iron chemists get more in touch with each other after using the standard drillings to check up their various methods, and realizing the benefits of uniformity in action.

This is now universally recognized, and there appears to be a desire on the part of many foundry, furnace and pig iron men, as well as chemists, to have the work of selecting uniform methods for making analyses pushed ahead as rapidly as possible.

Your committee has been approached so frequently of late on this subject that upon the formal request of J. O. Henshaw of N. S. Bartlett & Co. they beg to recommend to the association that a special committee to represent the interests of the foundry, furnace and chemist be appointed to proceed with this work, with a view of presenting a set of standard methods for determining the constituents of pig and cast iron upon which these materials can be bought and sold.

Dr. Moldenke, who is a member of the bureau, stated: "The work of the Standardization Bureau is known all over the world, and we are now ready for the next step, as announced, and that is the selection of a standard. In connection with methods by which the chemists can analyze the iron so that the purchaser will know what he buys it is suggested that we do not adopt one standard method but possibly several to give the same results."

Dr. Moldenke moved that an additional committee of three be appointed by the present committee "for the selection of uniform methods for making determinations of constituents of pig iron and cast iron, and report at the next convention." This motion was carried.

Standardizing the Testing of Cast Iron.

Dr. Moldenke, the chairman of this committee, read the report, which was in part as follows:

Your committee desires to state that during the past year sufficient work has been done to warrant a final report based upon the results obtained and the conclusions derived therefrom. We must, therefore, beg that our report be received and our committee on standardizing the testing of cast iron be discharged; and we beg further that permission be granted to the individual members of our committee to utilize the mass of material collected, for further investigations of interest to the foundry trade and the publication of such results as part of the proceedings of this association.

Since our last convention there have been made 555 tests, many of which were kindly performed by H. E. Diller of Pittsburgh, Pa., making the sum total for the complete work 1601 tests made on 1229 test bars, not counting the chill pieces and fluidity strips, the whole material handled weighing, roughly, 15 tons.

There is considerable detail still remaining in the way of tabulations and critical studies of our series of tests made in all the distinctive classes of cast iron. The results we have obtained have been thoroughly discussed by us, and are summarized in the following:

There are two methods of judging the physical quality of castings: 1, In the abstract—judging the quality of the iron entering into them; this leaves out the elements of uncertainty introduced by the things which happen after pouring. 2. In particular—the quality of the casting for the purpose intended. This can only be ascertained by testing the casting itself, or at least the representatives of a given lot. This latter method, of greatest importance to the buying element, will likely always be studied and specified by them, and cannot therefore be well taken up by our foundrymen on the initiative. Car wheels, car couplers, boiler castings, pipe, &c., are among the numerous things now bought regularly under specifications which insure good results, the tests being made on the castings themselves. As these particular instances, however, will always remain the great minority of the foundry product, the method of testing which will most concern us is that which judges the iron entering into the molds.

Cast iron, so far as its availability for various classes of castings is concerned, depends upon a given chemical composition and a physical constitution dependent also upon the nature of the mixture and the heat treatment. That is, once the chemical composition best suited for the work is determined upon, there still come in the effects of the kind of pig iron used, the proportion of pig iron to remelted material, the steel and other additions, the melting process used, and the kind of molds poured into.

If you will look over the records of tests published by this committee you will see that we have differentiated the various classes of iron into all pig, and pig and scrap mixtures. Then again into cupola and furnace irons, warm and cold blast charcoal, coke and mixed charges. Finally in an arrangement which divides the classes by their chemical constituents. Table I shows this more clearly:

Table I.

Series.	Class of iron.	Melted in	Pig iron used.	Size of heat Tons	Si	P.	S.
A*	Ingot mold	Cupola	Coke	60	1.67	0.095	0 032
B	Dynamo frame	Cupola	Coke and charcoal	60	1.95	0.405	0.042
C	Light machinery	Cupola	Coke and charcoal	40	2.04	0 578	0 044
D	Chilled roll	Air furnace	Cold blast charcoal	30	0 85	0.482	0 07
E	Sand roll	Air furnace	Warm blast charcoal	30	0.72	0.454	0.07
F**	Sash weight	Cupola	Coke and charcoal	15	0 91	0.441	0.218
G	Car wheel	Cupola	Charcoal and coke	10	0.97	0.301	0 06
H	Stove plate	Cupola	Coke	20	3.19	1.160	0.084
I	Heavy machinery	Cupola	Coke	30	1 96	0.522	0.081
J	Cylinder	Cupola	Coke	10	2 49	0 839	0.084
K	Novelty	Cupola	Coke	5	4.19	1.236	0.080
L	Gun metal	O H. furnace	Coke and charcoal	10	2 32	0.676	0.044

*All pig iron.
**Nearly all burnt scrap originally from charcoal and coke irons.

Throughout the whole line of operations only regularly constituted mixtures were used, the balance of the heats from which these test bars were cast going directly into commercial castings of the classes designated. The results are therefore entirely comparable with daily practice, and are not exceptional cases prepared specially for a good showing. For purposes of comparison green sand and dry sand bars were made

side by side, even though the iron in practice goes into only one of these classes of molds. It was felt that comparison records were wanted just as much as specifications for the separate lines of product. For this reason also we recommend one standard size of test bar for comparative purposes only, each class of iron being given its special treatment for the information wanted in daily practice in addition.

Our studies on the shape of the test bar have resulted in the selection of the round form of cross section, and this mainly on the score of greatest uniformity in physical structure, the corners of the square bar introducing elements which become troublesome, especially in irons with a lower range of the silicon contents.

SIZES OF TEST BARS.

The following are the sizes of bars selected for tests as a result of our investigations:

For all tensile tests a bar turned to 0.8 inches in diameter, corresponding to a cross section of ½ square inch. Results, therefore, multiplied by two, give the tensile strength of per square inch.

For transverse test of all classes of iron for general comparison, a bar 1½ inches in diameter on supports 12 inches apart, pressure applied in middle and deflection noted. Similarly for ingot mold, light machinery, stove plate and novelty iron a 1½ inch diameter bar—that is to say, for irons running from 2 per cent. in silicon upward or from 1.75 per cent. silicon upward where but little scrap is in the mixture.

For dynamo frame, sash weight, cylinder, heavy machinery and gun metal irons, similarly a 2-inch diameter bar is recommended—that is, for irons running from 1.50 to 2 per cent. in silicon, or where the silicon is lower and the proportion of scrap is rather large.

For roll irons, whether chilled or sand, and car wheel metals, a 2½-inch diameter bar is recommended—that is, for all irons below 1 per cent. silicon, and which may therefore be classed as the chilling irons.

PROPOSED STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS.

1. Unless furnace iron, dry sand or loam molding, or subsequent annealing is specified, all gray iron castings are understood to be of cupola metal; mixtures, molds and methods of preparation to be fixed by the founder to secure the results by purchaser.

2. All castings shall be clean, free from flaws, cracks and excessive shrinkage. They shall conform in other respects to whatever points may be specially agreed upon.

3. When the castings themselves are to be tested to destruction, the number selected from a given lot and the tests they shall be subjected to are made a matter of special agreement between founder and purchaser.

4. Castings made under these specifications, the iron in which is to be tested for its quality, shall be represented by at least three test bars cast from the same heat.

5. These test bars shall be subjected to a transverse breaking test, the load applied at the middle with supports 12 inches apart. The breaking load and deflection shall be agreed upon specially on placing the contract, and two of these bars shall meet the requirements.

6. A tensile strength test may be added, in which case at least three bars for this purpose shall be cast with the others in the same molds respectively. The ultimate strength shall also be agreed upon specially before placing the contract, and two of the bars shall meet the requirements.

7. The dimensions of the test bars shall be as given herewith. There is only one size for the tensile bar and three for the transverse. For the light and medium weight castings the 1½-inch D bar is to be used, heavy castings the 2-inch D and chilling irons the 2½-inch D test bar.

8. Where the chemical composition of the castings is a matter of specification in addition to the physical tests borings shall be taken from all the test bars made, well mixed, and any required determination, combined carbon and graphite alone excepted, made therefrom.

9. Reasonable facilities shall be given the inspectors to satisfy themselves that castings are being made in accordance with specifications, and, if possible, tests shall be made at the place of production prior to shipments.

The first paper considered by the delegates during the afternoon session was delivered by A. J. Rossi of New York City. It was entitled:

Influence of Titanium on the Properties of Cast Iron.

and was in part as follows:

Titanium is a very common constituent of iron ores. When below 1 per cent. it is usually ignored. When, however, the titanium oxide runs from 10 to 40 per cent. or over, the ores may be legitimately called "titaniferous" iron ores, and these occur in mountain masses in several States. Usually free from sulphur, and particularly phosphorus, and low in silicon, they form excellent stock to mix with soft ores.

We have positive statements on the influence of titanium on cast iron which show that it is favorable, be the action itself a direct one by alloying, or indirect by the removal of deleterious influences. My own experience in producing several hundred tons of pig iron of this nature from ores running 14 per cent. titanic acid, 59 per cent. metallic iron, 1.5 silicon, 0.017 phosphorus, and 0.025 sulphur, may be of interest as bearing directly upon our subject.

The analysis of this pig iron is as follows:

Silicon	0.12	0.174	0.36	0.17
Manganese	0.08	0.232	0.07	0.25
Titanium	0.07	0.183	0.24	0.05
Combined carbon	1.35	3.070	2.95	3.09
Graphite	0.14	0.327	0.24	0.255
Phosphorus	traces.	0.024	traces.	0.03
Sulphur	0.059	....	0.045	0.022

This iron, an ideal stock for open hearth, was very strong; it could almost be forged cold and proved very valuable in car wheel mixtures. Added to foundry iron it increased the tensile strength considerably and is said to have retarded the solidification of the metal in the molds materially. Twenty-five per cent. to 30 per cent. of this iron in admixture with others cast in chills could not be touched by chrome steel drills, and reamers for the hubs of car wheels made of this mixture, and subjected to the most trying conditions, were found in good order after one year's service. Test bars with 25 per cent. of this titanic pig iron 1 inch x 1 inch x 12 inches between supports broke at 3480 pounds, and cast on 1½ inch x 1½ inch x 2 inches chill blocks gave a chill 1.62 inches deep. The original metal had a transverse strength of 3390 pounds and chilled 1.06 inches. The addition of 5 per cent. of the pig similarly gave 3778 pounds and a chill of 1.37 inches, while the pig itself gave 2750 pounds and was chilled throughout.

The general conclusions derived are that a 4 per cent. addition of a 10 to 12 per cent. titanium alloy is most effective for the improvement of the castings made. It is also confidently believed that the alloy can be made cheap enough to allow a 4 per cent. addition to be made without affecting the cost of the castings seriously, for the benefits derived are such that expensive irons can easily be cut out or at least reduced to smaller amounts in a given mixture.

The tensile strength of irons running from 11,000 to 15,000 pounds per square inch was raised to 20,000, and good irons with 20,000 to 25,000 pounds rose up to 28,000 and 35,000 pounds and more after the titanium additions. The deflections also follow closely and the parallelism of the curves shows that the improvement is not a casual one only. A series of tests were made recently to determine the value of additions of 1, 2, 3 and 4 per cent. of the 10 per cent. alloy respectively, the results of which follow later.

While the tables seem to show that the action of titanium, so far as the improvement of the castings is concerned, is a direct one, yet there may be some indirect effects involved. For instance, there may be occluded gases, such as nitrogen or oxides and nitrides of iron, which prevent the intimate contact of the crystals

so necessary for strength removed. The action of titanium has been long suspected; in fact, was pointed out by Wm. Metcalf, as the metal titanium not only unites readily with nitrogen, but actually burns in it. In any case the analyses before and after using show practically the same composition so far as silicon, the carbons and other constituents are concerned, except for the titanium found in the pig iron originally. This would show the value of titanium on the admittedly poor irons and open a field for them which would dispose of much stock now sacrificed.

The question of expense is really not so serious as it looks, for the improvement effected justifies an extra outlay. Thus chromium costs about $1 a pound, nickel 35 cents, tungsten 90 cents, and even $2 a pound is paid for molybdum. Yet all these metals are used extensively in steel making and in percentages ranging from 3 to 10 per cent. to be of use.

The same remarks hold good for cast iron. For steam and water pipes, gate and steam valves, steam fittings in general, working under the great pressures now required for large steam cylinders, fly wheels and many purposes of foundry where a great tensile strength is a desideratum, these alloys could find an excellent application.

Car wheel materials have special requirements to fulfill which necessitates a careful choice of the materials entering in the mixture. If, by the addition of the alloy, the use of cheaper materials becomes admissible, even thus realizing superior results to those now obtained, such addition not only may not increase the first cost, but actually lower it. Certain railroads which require the "thermal test" are even willing to pay extra for the best results. In this particular line there is a still more important consideration. It appears that, with the new pressed steel cars, which have a capacity of 100,000 pounds, as against some 50,000 pounds, as formerly, the pressure on the wheels becomes so great that the tire actually disintegrates under the strain and that wheels guaranteed to furnish a five years' service and excellent otherwise will not stand a run of 10,000 miles, or less than one year's service. The demand for a stronger material is imperative here, and the question of cost has lost much of its importance. Would not this case (which is only one example among many other applications of the same kind which could be given) show that the use of titanium, which secures a considerably increased tensile strength in the body of the wheel and a greater strength and hardness of chill on the tire, can be particularly well adapted, even were it to cause a slight extra expense?

We have already mentioned the possible applications of the alloy for mixtures for crushers of all kinds. Assuming the increase in tensile and transverse strength to be as observed in the experiments recorded, or 25 to 30 per cent., does not such an improvement admit of the possibility of diminishing the thickness and weight of castings which are not necessarily required to stand special or severe strains? Cannot this saving of materials offset the entire expense resulting from the alloy, small as it would be in any case, for ordinary foundry purposes?

At one of the greatest construction works of the country large cylinders which are poured very hot show iron with a low tensile strength, even if the silicon and phosphorus are kept quite low. Were the titanium alloy added here the extra heat would only result in an advantage, for the hotter the more complete the incorporation. In another foundry it was observed that the solidification of the metal in the molds was retarded considerably, and this may be explained by the very high specific heat of the alloy used. Here, then, is another advantage, especially for roll makers who wish to keep on feeding into the head a long time.

At the request of the secretary of your association, and through the courtesy of the Abendroth & Root Mfg. Company, I was enabled to make a set of tests to show the effect of adding various quantities of ferro-titanium to ordinary foundry mixtures. The work was carried on impartially and the results herewith may be relied upon as accurate:

A.—Bars Cast Horizontally.

	Transverse strength, pounds.	Inc. per ct.	Tensile strength, pounds.	Inc. per ct.
Original mixture	2,030	...	20,500	...
1 per cent. addition of alloy	2,100	3.5	22,200	8.
2 per cent. addition of alloy	2,200	8.	24,600	20.
3 per cent. addition of alloy	2,300	13.	26,000	26.9
4 per cent. addition of alloy	2,550	25.	25,900	26.4

B.—Bars Cast Vertically. (Another series of tests.)

	Transverse strength, pounds.	Tensile strength, pounds.
Original mixture	1,393	16,600
1 per cent. addition of alloy	2,410	18,100
2 per cent. addition of alloy	2,000	19,500
3 per cent. addition of alloy	2,300	20,600
4 per cent. addition of alloy	2,360	20,000

It will be seen that the effect of 3 to 4 per cent. is marked and adds one-fifth to the strength of the material.

A paper entitled

The Problem of the Molder

was read by John G. Sadlier, Springfield, Ohio.

Although there have been a number of large and excellent castings made in this country, yet the progress in this direction has not kept pace with the advancement in others. In the last 50 years the advancement in machinery construction has been so rapid that it appears almost phenomenal. From the old time operating hand machine we have come to the improved automatic machines, which almost cover the entire range of manufacturing where there is a great number of one kind of piece to be produced.

The foundry alone appears to stand very nearly where it stood years ago. The reasons to be assigned for this we would divide into two classes:

First, the increase of specialists. It seems to be the aim and object of many proprietors to teach their apprentices or beginners to make one piece, and when they succeed in making that satisfactorily, to keep repeating the operation from year to year as long as they will stay in their employ. In many cases the apprentice becomes tired of this state of affairs and seeks employment elsewhere; and if he secures it and is able to hold his position at all, he will be given the most inferior and simple work in the shop, for the simple reason that he has probably been tried on something better and has failed to give a satisfactory result. Once he has been relegated to what is known as the side floor in a shop it is very difficult for him to get a change. The result is, he will never rise above a third or fourth class mechanic.

The second and great reason for the slow advancement of the foundry is found in the peculiar characteristics of the business itself. There is nothing in the way of mechanical arts or mechanical sciences that requires more thought, more mechanical skill and more skillful practice. In all the other trades and professions there are rules, tables, gauges and fixed and systematic order, that can be and are applied to the different requirements, besides these a great amount of literature well and ably written, giving full and detailed instructions as to the quickest, safest and best method of accomplishing certain results. Tables on strength, tables on pressure, tables on measurement, and many others that are used are the result of ages of experience and practical test. All these fall short when you come to apply them to molding, as that is learned almost entirely by the sense of feeling, a sense which cannot be transmitted to another, nor can it be transferred to paper. It is something that must be acquired by actual practice. The sense of touch plays such an important part in the construction of a mold that without it it is impossible to construct a mold with any reasonable expectation for success.

The feeling of the sand for its proper temper, its adhesive qualities, and as to its porosity; then in ramming, the molder's sense of feeling should be trained to such a degree that he can tell at every stroke of the rammer whether he struck the bottom with sufficient force to ram the sand to stand the strain of the iron, or to prevent it from crumbling if dried, or to lift well in those parts which are to be raised off.

The material handled by the molder is of a very delicate nature, and is easy to disarrange through a very slight mistake in any way. Then, again, the iron delivered to him is very frequently too dull to make clean, sound, perfect castings and consequently his labor is all in vain.

In the foundry a slight mistake or oversight will cause the entire day's, and sometimes the entire month's, work to go to the scrap pile. A mistake or oversight here cannot be seen in time to correct, consequently the molder is looked upon as careless and indifferent. He has probably made two molds from one pattern as near alike as possible; the casting from one will be a beautiful thing to look at, and the other will probably be a misshaped, ungainly candidate for the scrap pile.

The best method to overcome these difficulties would be to leave nothing undone to educate the apprentice after he has secured a position in the shop in which he proposes to learn molding, as complete as possible, through his course of apprenticeship, until we land him on the highest rung of foundry fame. And in doing this we hope, in a measure, to solve the molder problem.

Before starting a boy in the shop as a full fledged apprentice, I would ask my colleagues in the foundry business to take this applicant for foundry honors on a probation of, we will say, three months; during which time he should be continually under the eye of the foreman, or his assistant, and watched very carefully without interfering or in any way coercing his action. If he exhibits an inclination to learn, is industrious, and becomes thoroughly interested in his efforts to become familiar with the foundry practice, he should be assigned some slight duty that would make him profitable. At the end of the probationary period make a contract with him for three years and nine months, giving him the benefit of the three months as a novice. If at the end of three months' probation he does not seem inclined nor interested, it would be a kindness to the boy to request him to try something else.

I do not believe that molders are born, not made, but I will say that unless you have the material in the individual to make a molder, you cannot possibly accomplish anything. After he has been accepted and regularly indentured, then it becomes very much the duty of the foreman to see that he will become a competent man and a good mechanic.

The boy starting in on his first piece feels a certain amount of excitement and interest which should be cultivated and kept alive. He should not be scolded, cowed or bullyragged for a slight mistake, but should be encouraged by a few kindly spoken words, as there never was a browbeaten and cowardly apprentice who made a successful or first-class molder. It is by implanting the spirit of "I can" and "I will" in the heart of an apprentice that you obtain the best results. What I mean by a cowardly apprentice is not the boy who will be afraid to knock his shopmate down for an insult, nor be afraid to resent harsh words or ill treatment, but the one who is afraid of losing the casting he undertakes to make. I believe there are more castings lost through an overanxiety to make the work correct than from carelessness or any other cause. Every shop should have one or more first-class journeymen whom the apprentice should be encouraged to take as his model, so far as possible. Yet it is necessary to encourage originality after a certain period. The apprentice should be encouraged to be self reliant, and be advanced as he succeeds in making good and satisfactory work. The older molders should not be allowed to stand in the way of advancing the apprentice on to the very best work in the shop, if he proves himself able to turn it out satisfactorily.

The apprentice should further be encouraged to interest himself in all the details of the foundry practice, the character of the sand best suited for the different classes of work, and also the different brands of iron that go into the mixtures for different grades of castings. In fact he should be taught that the mixing of the metal and cupola practice is second only to the making of the mold itself. The character of the coke, the hight of the melting point in the cupola, the regulation of the blast, the temperature at which the iron is melted and the grading by fracture and other methods; all these he must be shown to have the greatest bearing on the finished casting.

The time spent in the education of the molder's apprentice in all points of foundry practice pertaining directly to the making of the casting is one of the best investments any foundry manager can make, for it is the apprentice well educated in these matters who makes the first-class molder.

Thomas D. West of Sharpsville, Pa., presented a paper on "The Effects of Variations in Manganese on Different Grades of Iron." A paper on "The Foundry, Its Equipment and Management," was presented by Edwin B. Gilmour of Milwaukee. Percy Longmuir of Sheffield, England, contributed a paper on "The Control of the Foundry."

Excursions.

On Tuesday evening, at 7.30, the delegates, to the number of about 250, boarded a special train on the New York Central provided by the Buffalo Foundrymen's Association and visited the Pan-American Exposition. Many of the exhibits are not yet in place, but the electrical display more than repaid the visit, being undoubtedly the finest exhibit of the kind ever given anywhere. The members returned at 10.45 thoroughly pleased with the programme of the day. All day Wednesday was consumed in a trip to Niagara Falls by special train.

Melting Brass

was the title of a paper by C. Vickers of Chicago.

Whatever kind of furnace may be used, the melting and handling of copper alloys requires the most careful supervision on the part of the management, or the loss of metal will be so great that it plays havoc with the profits of the business. This loss is greater in summer than in winter, as the great heat to which the men are exposed saps their vitality and makes it impossible for them to stand up to their work as well as in cold weather. More metal is therefore spilled in the furnaces and lost by oxidation. The ashes and skimmings should receive careful attention, and the recovered metal be promptly used up. The cost of melting may be greatly increased by the injudicious handling of crucibles.

Some brass foundries habitually use tongs with only one set of straps; tongs such as this are very liable to crush the pot, especially when used for pouring. They grip the pot a little below the bilge. When the lip of the pot is rested on the edge of the mold and the tongs pulled over to lip it in pouring, if the tongs do not grip with great force the leverage will cause them to slip, and this is fatal to the successful running of light work. The pressure of the tongs being great enough to hold the pot firmly, it is soon squeezed out of shape and becomes oval. This continues until a crack is developed and the further usefulness of the pot is ended. Tongs with two sets of straps are the best, one set gripping below and the other slightly above the bilge. They are very liable to warp out of shape, however, and should be fitted from time to time to a new pot. Tongs with ace of spade shaped points, the ace gripping below the bilge and the straps around the same, ought not to be used in "pulling out," as the fuel will often prevent their going to place, and the points of the ace grip the pot where they are not intended to fit and they sink into and pierce the softened pot.

To obviate these troubles furnaces have been devised from which the crucible is never removed, the metal being poured out by tipping the furnace. This is all right on heavy work, but is useless on work where the metal must be used "jumping hot," as the transference to a pouring vessel will inevitably cool it. For exceedingly light work experience has taught that small crucibles and tong pouring are the best.

It is a good idea to have two spouts to a crucible, one at right angles to the other. This second spout can be easily made with a file, before the pot is used. Then if both spouts are used alternately in pouring, the pot will retain its circular form and not be so liable to crush.

Crucibles are often broken when melting ingot copper and heavy pieces of brass, by carelessness in packing the same when the pot is charged. Each ingot should rest

on the bottom of the pot and not be suspended by other ingots on the sides of the pot; otherwise when melting commences these suspended ingots are liable to act as a wedge, and in sinking burst the softened crucible.

When brass is melted with ingot copper it is often good practice to melt the brass first, placing the copper ingots on top of the pot and when hot dropping them into the melted brass. This will cut them away, bringing the heat out quicker.

A paper on

Green Sand Cores

was read by P. R. Ramp, Aurora, Ill.

A green sand core is a core constructed from the same material used to make a green sand mold. It is not dried in an oven but placed in the mold as soon as completed, thereby saving the fuel that is necessary to fire the core oven when dry sand cores are used. In making light castings the green sand core has an advantage over any other core because it overcomes the rough and irregular joints that are often found where a dried core and a portion of the mold come in contact with each other. In cases where a large core is nearly completely surrounded by a thin casting the green core is the best also. If a dried core is used there is always a liability of the heat from the casting causing the material in the dried core to expand and thus break the casting. Another advantage is when cleaning castings a very large dry sand core requires considerable time and labor to dig out of the casting; if a green sand core is used all that is required is to rap the casting in order to remove the sand.

Green sand cores can be used to advantage in the production of plumbers' ware—*i. e.*, soil pipe, elbows, tees, &c. Also locomotive smokestacks, railroad oil boxes and similar castings. These cores cannot be made strong enough to be handled without some kind of a support. An arbor, usually made of cast iron, often of wood, is used to carry them.

In making a green sand core for a locomotive smokestack the proper rig would be a cast iron core barrel 1 inch thick, the shape of the cored portion of the stack, allowing only about 1 inch for sand between the barrel and the inside of the stack. The barrel must be cored with prickers about 1½ inches long by ½ inch in diameter, tapering to a point, in order to carry the sand. There should be equally as many ½-inch holes in the barrel to allow the gas to escape freely. Both ends of the barrel should be turned off to suit the ends of the flask the mold is made in. The core is formed by setting the barrel on two wooden horses with iron bearings attached to them for the spindle of the barrel to rest in. The sand is now pressed between the prickers and a strike of the proper shape is placed on the wooden horses the right distance from the barrel. A crank is used to turn the barrel as fast as the sand is pressed between the prickers. In this manner a stack of any thickness may be made from one core barrel. As soon as the mold is poured and the casting is cool enough a chain is hooked onto the end of the barrel and the barrel and casting are hoisted to a vertical position. A little rapping on the casting will cause the sand between the core barrel and the casting to run out and relieve the sack, which will drop off of the barrel. In this case a dried core would make a very poor job. Not only would it cost more to make the core and furnish the material, but, as stated before, the expansion of the material would break the casting, which generally averages about 3-16 inch thick.

Core barrels for soil pipe cores are made on the same principle. Instead of prickers, however, depressions are made in the barrel. Where it is not possible to use a core barrel arbor and anchor, lifting plates are used. Often the arbor must be made in sections to enable the molder to get it out of the casting after the mold it poured. Lifting plates are generally made with threads for lifting screws to make it possible to take the screws out after the green sand core is placed in its position in the mold. There is considerable core sand and labor saved in making railroad oil boxes with a green sand core. In this case an arbor made in sections is used, the shape and number of sections depending entirely on the size and shape of the oil box.

There are many small dry sand cores (such as cores forming round and square holes of different sizes) used that could be made in green sand much cheaper. One of the reasons they are not made in green sand is because the pattern maker, as a rule, carries a stock of core prints of different sized round and square cores. He knowing there are core boxes for the different sized cores in the foundry, finds it much less trouble to tack on several small ready made prints than to finish out several holes the same size so they will leave the sand properly. As a result the foundry foreman is disgusted to find that he is compelled to make a lot of small dry sand cores, say 1 inch by 1½ inches, that could just as well be made in green sand. There is, without a doubt, quite a sum of money spent every year for labor and material to make dry sand cores that could just as well be saved or put to some better use. So it is with the dry sand cores; we often find foundrymen worrying along with a job trying to use green sand cores where a dry sand would be the cheaper. To be able to judge which of the two kinds of cores is the better and cheaper to us in making any certain job, we must have practical experience in the business. For instance, in case of the smoke stack a dry sand core would not be practical, neither would a green sand core for the steam ports or bore of a Corliss cylinder be a success.

Green sand cores are not good for making bulky castings where there is a heavy pressure of metal. One reason is because it is not possible to make a green sand core hard enough to withstand as great a pressure as a dry sand core will stand without a cut or scab. Another point in favor of the dry sand core is when it is placed in the mold, say an oil box, if it does not give the proper metal on all sides by reason of it not being placed in properly, it can be taken out and reset, whereas in case of the green sand core it is very risky business to remove it after it has been placed in the mold.

So I say in conclusion that in making light castings there are many cases where the green sand core can be used to a decided advantage. On the other hand there are cases where the dry sand core is the better. I am a little inclined to favor the dry sand core, except in cases as mentioned above, because I think the dried core is the safest, and in making castings of any great size that must be free from dirt, &c., I have always found it cheaper to make a dry sand mold. Many foundries do not favor dry sand cores. Often it is because the core sand they are using is not what it should be. In making cores for locomotive and Corliss engine castings I use for my core sand mixture about 6 parts heavy molding sand and 4 parts sharp building sand. If my castings do not clean very well or show dirt I add a little more sharp sand. Many foundrymen worry about the blacking. My experience has been, if I used a good open sand and have vented the core of mold well, and had it thoroughly dry, a fair grade of blacking always did the work as well as a more expensive grade.

The foundry supply men often speak of the different foundries that use their blacking. I always think, "Well, no matter how good the blacking if there is not a good open sand behind it."

We often find cases where the blacking on the dry sand mold or core has washed off in flakes before the iron while it was being cast. One of the old established remedies for this trouble is molasses water. This does some good, but I feel satisfied that a little more coarse sand in the mixture would be of more benefit.

Other papers read were "The Economic Status of Wages," by E. H. Putnam, and "Foundry Metallurgy," by H. E. Field of Ansonia, Conn.

Members in Attendance.

Among those present were:

W. A. Jones, W. A. Jones Foundry & Machine Company, Chicago, Ill.
I. S. Seaman, Seaman-Sleeth Company, Pittsburgh, Pa.
Dr. R. Moldenke, secretary A. F. A., New York, N. Y.
C. S. Bell, C. S. Bell Company, Hillsboro, Ohio.
Howard Evans, secretary Philadelphia Foundrymen's Association, Philadelphia, Pa.
J. Frank Dye, Newport, Ky.
O. T. Stantial, Illinois Malleable Iron Company, Chicago.
F. W. Schultz, *The Iron Age*, New York.

A. L. Colby, Bethlehem Steel Company, South Bethlehem, Pa.
H. G. Byram, Byram Foundry Company, Indianapolis, Ind.
F. C. Schwoerer, Indianapolis Foundry Company, Indianapolis, Ind.
J. S. Robeson, American Glucose Company, Camden, N. J.
J. J. Bever, the Otis Steel Company, Limited, Cleveland, Ohio.
J. P. Winlock, Barbour-Stockwell Company, Cambridge, Mass.
A. W. Link, Erie Foundry Company, Erie, Pa.
A. Carpenter, A. Carpenter & Sons Foundry Company, Providence, R. I.
David Reid, Caco & Pettie Machine Shops, Biddeford, Maine.
W. G. Roshwell, General Electric Company, Schenectady, N. Y.
D. F. Eagan, H. E. Pridmore M. M. Company, Chicago, Ill.
J. D. Smith, J. D. Smith Foundry Supply Company, Cleveland, Ohio.
M. F. Gallagher, New York Air Brake Company, Watertown, N. Y.
F. S. Cadwell, Hill & Griffith Company, Cincinnati, Ohio.
A. W. Bair, C., M. & St. P. R. R., Milwaukee, Wis.
S. G. Flogg, Jr., S. G. Flogg & Co., Philadelphia, Pa.
Mrs. A. W. Bair, Milwaukee, Wis.
E. B. Gilmour, E. P. Allis Company, Milwaukee, Wis.
D. Fraser, Chain Belt Company, Milwaukee, Wis.
R. S. McLerran, E. P. Allis Company, Milwaukee, Wis.
W. A. Draves, Northwestern Malleable Iron, Milwaukee, Wis.
W. B. Hosford, Dodge Mfg. Company, Mishawaka, Ind.
H. L. Bell, Dodge Mfg. Company, Mishawaka, Ind.
G. H. Lincoln, Geo. H. Lincoln Company, Boston, Mass.
J. A. Langan, Lawrence, Mass.
F. S. Phelps, H. E. Pridmore, Chicago, Ill
S. D. Thompkins, Smooth On Mfg. Company, Jersey City, N. J.
Chas. N. Choate, Bpt. Deox. B. & M. Company, Bridgeport, Conn.
B. M. Shaw, Walker & Pratt Mfg. Company, Boston, Mass.
Thos. West, Sharpsville, Pa.
W. J. Sherman, Bethlehem Steel Company, Bethlehem, Pa.
C. L. Prince, General Electric Company, Schenectady, N. Y.
J. A. Walker, Dixon Crucible Company, Jersey City, N. J.
Robt. A. Walker, *The Iron Age*, Pittsburgh, Pa.
J. A. Logan, Jones & Laughlins, Pittsburgh, Pa.
S. D. Sleeth, Westinghouse Air Brake Company, Pittsburgh, Pa.
F. H. Zeimers, Union Foundry & Machine Company, Pittsburgh, Pa.
S. Groves, Westinghouse Machine Co., Pittsburgh, Pa.
E. J. Lyon, Brown & Sharpe Mfg. Company, Providence, R. I.
Theo. H. Colvin, Colvin Foundry Company, Providence, R. I.
H. E. Ashbury, Enterprise Mfg. Company, Philadelphia, Pa.
W. F. Prince, H. R. Worthington, Elizabeth, N. J.
J. Hill, The Hill & Griffith Company, Cincinnati, Ohio.
S. F. Johnston, The S. Obermayer Company, Chicago, Ill.
C. D. Koch, Wm. Sellers & Co., Incorporated, Philadelphia, Pa.
E. W. Smith, Crane Company, Chicago, Ill.
E. H. Mumford, Tabor Mfg. Company, Philadelphia, Pa.
C. J. Wiltshire, Gates Iron Works, Chicago, Ill.
A. M. Thompson, Link-Belt Machinery Company, Chicago, Ill.
Phil. C. Smith, Ingersoll, Sargeant Drill Company, Easton, Pa.

The Pittsburgh Steel Company.—The Pittsburgh Steel Company, being organized in that city, will apply for a charter this month, with a capital of $2,000,000. The concern will take over the business and plant of the Pittsburgh Steel Hoop Company, at Monessen, Pa., makers of hoops and bands. Wallace H. Rowe, who has resigned as Pittsburgh manager for the American Steel & Wire Company, will be president of the Pittsburgh Steel Company, he having been a large stockholder in Pittsburgh Steel Hoop Company ever since it was organized. It is the purpose of the Pittsburgh Steel Company to very much enlarge the present works of the Pittsburgh Steel Hoop Company, and to take up new lines of manufacture. A number of basic open hearth furnaces will be built. A blooming and billet mill and a rod mill will be added and also a number of barb wire, plain wire and wire nail machines. The concern propose to become factors in the rod, wire and wire nail trades. The incorporators of the Pittsburgh Steel Company will be Wallace H. Rowe, John Bindley and Edwin Bindley of the Bindley Hardware Company, Emil Winter, Willis F. McCook and W. C. Reitz, who is now treasurer of the Pittsburgh Steel Hoop Company. George Nash, who for some time has been manager of the Braddock and Rankin works of the American Steel & Wire Company, has also resigned, and has been appointed manager of the enlarged works of the Pittsburgh Steel Company. Contracts for some of the new equipment have already been placed and others will be in a short time. Ground for these extensions will be broken in a few days.

Henry R. Wills, vice-president of the Hoyt Metal Company of St. Louis, Mo., died on May 22, at his residence in Alton after a brief illness, aged 53 years.

OBITUARY.

THOMAS M. AVERY.

Thomas Morris Avery, founder of the Elgin National Watch Company and long a prominent factor in the commercial life of Chicago, died at his home in the latter city May 26, aged 79 years. Mr. Avery was born in Madison County, N. Y., where his parents were pioneers. He was educated at the Chittenango Polytechnic School and the Cazenovia Academy. As a young man he engaged in mercantile pursuits, and before he attained his majority he was a partner with his uncle in one of the leading establishments of Central New York. In 1851 the business was sold and Mr. Avery removed to Chicago. He engaged in the lumber business, and became noted as one of the most successful dealers in the West. In 1875 he abandoned the lumber trade, having already organized the Elgin National Watch Company, of whom he acted as president from 1867 until his age and failing health compelled him to relinquish the position. He was president for over 30 years, and it was due in the largest measure to his energy and ability that the enterprise grew to its present proportions. Mr. Avery also organized the Chicago Brass Company, with extensive rolling mills in Kenosha, Wis., of which his son, the late Frank M. Avery, was general manager until his death a year ago.

NOTES.

GEORGE R. GOSLING, president of the R. Plews Mfg. Company of Central Falls, R. I., makers of mill machinery, died on June 2.

RUFUS H. PRATT, a prominent manufacturer, of Hartford, Conn., died on June 3 at his home in that city from apoplexy, at the age of 68 years. He was the founder of the Bell Castings Foundry and of the Pratt & Cady Mfg. Company, makers of steam governors. In recent years he had been connected with the Johns-Pratt Company, manufacturers of asbestos.

SAMUEL WIGGINS SKINNER, president of the Cincinnati Shaper Company, and one of the most prominent business men of Cincinnati, died on May 22. He was a grandson of the late Samuel Wiggins, one of the pioneers of the West. The grandfather owned large tracts of land in and about Cincinnati, and was at one time president of the old Lafayette Bank.

ALVAH WOODWORTH, a veteran foundryman of Manlius, N. Y., died on May 17 from pneumonia, at the advanced age of 92 years. He was born at Lenox, N. Y., and at an early age worked on the Erie Canal. Subsequently he entered the employ of Avery & Lyon, foundrymen, in Syracuse. Later he went to Manlius and engaged in the foundry business, which he conducted for many years under his own name.

WILLIAM JOHNSTON, president of the Pittsburgh Mfg. Company of Pittsburgh, Pa., died on May 19 at the home of his son-in-law, Charles B. Seaman, in that city. He was born in Ireland in 1832 and came to America in 1851, going to Pittsburgh, where he worked in various industries. In 1872 he purchased an interest in the plant of the Pittsburgh Mfg. Company, makers of rivet, bolt and general machinery, and became president of the concern.

HARVEY W. RICE, an engine builder of San Francisco, Cal., died there on May 24, at the age of 68 years. He was born in New York, and went to Haywards, near Oakland, Cal., in 1852, where he established a works for the manufacture of engines, subsequently removing to San Francisco. His invention of a straw burning thrasher engine revolutionized grain handling in California.

COL. JAMES G. MINER, who died in poverty on May 28, at Milford, Ohio, was, before the Civil War, one of the owners of the Tredegar Iron Works of Richmond, Va. He was born in New England 82 years ago, and went to Texas when a youth. The Civil War swept away his fortune, and his remaining years were spent in unsuccessful effort to build up a new fortune. Colonel Miner was assistant secretary of the Confederate navy during the war.

The National Association of Manufacturers.

Some 200 members and guests were present at the opening session of the sixth annual convention of the National Association of Manufacturers, in the Hotel Cadillac, Detroit, Mich., Tuesday morning, June 4. The convention was called to order by President Theodore C. Search, who presented George H. Barbour of Detroit, chairman of the local Executive Committee. Mr. Barbour welcomed the convention to the city, expressing his regret that only a three-days' session had been provided for, as the citizens would have liked more time to enable them to show their guests more of the beauties and the great manufacturing establishments of the city than they would be able to see in the short time allotted for their visit. Mr. Barbour introduced Mayor William C. Maybury, who made an entertaining address, in which he expatiated on the advantages of the city, painting its delights as a place of residence in glowing colors, and giving interesting facts relative to its business interests, then going into broader fields relative to the wonderful progress made by the country. He predicted that in time it would be found that every nation would find its proper place in supplying the wants of the world, each producing or manufacturing that for which it is best suited, and thus knitting all more closely together both commercially and socially. He closed by very cordially welcoming the convention to Detroit. President Search replied in behalf of the association, and taking up a portion of the Mayor's address, related a conversation with an English friend with whom he had traveled for some time in Upper Michigan. The Englishman had been so deeply impressed by the evidences of material progress seen everywhere that he had been trying to find a solution, and told Mr. Search that he believed he had found it. The solution was that practically every man in America, whether a workingman or not, was an engineer—that is, he was an independent thinker. Continuing, Mr. Search said that American methods are peculiar to America. He believed that the great cause of this intelligent energy and this development, now giving us such a prominent place in the trade of the world, is the universality of the public school system. If to this we add the greater development of our technical schools, we will make such further progress that no other nation can beat us. He thanked the representatives of Detroit for their hearty welcome, and had no doubt that the visitors would carry away with them the most delightful memories.

Secretary E. P. Wilson read the following list of names of those appointed by the president to serve on the respective standing committees:

Rules and Order.

Hamilton Carhartt, Michigan.
Frederick W. Sivyer, Wisconsin.
Leslie Moulthrop, Connecticut.
W. H. Tarbox, Massachusetts.
M. M. Eavenson, Pennsylvania.
W. T. Wilson, New York.
H. M. Lane, Ohio.

Credentials.

George T. Coppins, Massachusetts.
Charles R. Billin, Illinois.
F. R. Tobey, Pennsylvania.
Henry W. Avery, Ohio.
F. H. Kalbfleisch, New York.
Henry Fairbanks, Vermont.
O. W. Johnson, Wisconsin.
W. S. Russel, Michigan.
M. R. Gardner, Indiana.

Resolutions.

Charles H. Harding, Pennsylvania.
George F. Brown, Illinois.
Charles A. Carlisle, Indiana.
W. M. Warren, Michigan.
Walter M. Lowney, Massachusetts.
J. A. Jeffrey, Ohio.
G. Gunby, Jordan, Ohio.
George W. Thurston, Rhode Island.
W. T. Tilden, Pennsylvania.
Charles F. Bliss, Connecticut.
W. L. Saunders, New York.
F. S. Kretsinger, Iowa.

Nominations.

Robert Laidlaw, Ohio.
W. H. Wihington, Michigan.
George M. Sargent, Illinois.
Thomas Dellher, Massachusetts.
D. M. Parry, Indiana.
E. P. Bullard, Connecticut.
Theodore Armstrong, Pennsylvania.
A. C. Chase, New York.
B. B. Conner, Alabama.
W. A. Dickey, Maryland.
Julius J. Estey, Vermont.

Constitution.

E. E. Pike, New Hampshire.
D. S. Walton, Jr., Connecticut.
Wm. M. Pratt, Massachusetts.
Fred. F. Smith, New Jersey.
M. T. Conklin, Michigan.
James W. Eaton, New York.
Coleman Sellers, Jr., Pennsylvania.

Auditing Committee.

A. Naumberg, New York.
J. S. Barnet, New York.
E. C. Klipstein, New York.

President's Annual Report.

President Search read his annual report, the leading features of which were a very strong argument in favor of reciprocity treaties; an exhaustive history of the controversy with Russia over the sugar duty, in the course of which the association took an active part in endeavoring to secure a decision by this Government which would avoid retaliation by Russia in raising duties on American manufactured products; an earnest plea in favor of a subsidy for an American merchant marine; an advocacy of the creation of a Department of Commerce and Industry as an addition to the Departments now having Cabinet representation; a statement relative to restrictions on interstate commerce and the desirability of legislation on this question; the necessity of the improvement of the consular service, and the desirability of the establishment of a parcels post. The need of the Nicaragua Canal was briefly set forth. The foreign warehouses established by the association have not been very successful the past year, owing to special conditions in each case, but the prospects are now brighter and they are expected to prove to be very useful in extending trade. The International Freight Bureau and the Department of Information, both maintained by this association, have proved very advantageous to the members, the former being especially helpful in promoting the export trade. He closed with an earnest appeal to manufacturers to promote more pleasant relations with their employees by the introduction of what are termed industrial betterment ideas. We print Mr. Search's remarks on reciprocity treaties elsewhere.

On motion of W. L. Saunders of New York the thanks of the convention were given Mr. Search for his able report, and the secretary was instructed to send a printed copy to every member.

Adjourned for lunch.

TUESDAY AFTERNOON.

(By Telegraph.)

Tuesday afternoon session opened with reports of officers and committees. Treasurer Charles A. Schieren's report was read, showing the association's annual income to be close to $100,000 and its disbursements not far from that figure, the balance in hand being $4046.

The Committee on Patents and Patent Laws, of which P. W. Gates is chairman, presented a most interesting report, which while frankly admitting that little had been accomplished, outlined the plan on which the committee are working to secure needed reforms in both domestic and foreign patent laws desired by American inventors and manufacturers.

The report of D. H. Burnett, manager of the International Freight Bureau, showed over double the number of firms using the facilities of the bureau, and a still greater increase in the number of shipments made under its auspices in the year ended the 1st inst., as compared with the preceding years. The bureau is now known as a forwarding agency in all transportation offices handling freight to foreign ports. The second

year's business has proved the scheme of the bureau to be on correct lines. As the business increases the advantages to be realized through the bureau will be increased. Some of the firms are now giving their entire export business to it.

The Committee on Rules, through D. H. Tarbox, chairman, reported a set of rules to govern the proceedings of the convention, which were adopted.

The Committee on Parcels Post, through Franklin H. Kalbfleisch, chairman, reported that nothing had been accomplished at the recent session of Congress. It was quite evident at the beginning of the session that only a few matters would be able to claim and secure Congressional action. The committee, however, have continued their investigations, which have served to make the necessity of a parcels post more evident. The opposition of country merchants is recognized, but the argument is made that no step was ever taken for the enlargement of general business and the extension of facilities for doing business which did not disappoint its critics.

The president's report was taken up for discussion, and the topic of reciprocity was considered. A letter from James Deering of Chicago was read, in which he strongly indorsed reciprocity, and urged the formal approval by the association of the French reciprocity treaty. The discussion which followed was decidedly one sided. W. C. Barker of New York, Oliver Williams of Pennsylvania, P. E. Montanus of Ohio, Fred. F. Smith of New Jersey, J. A. Jeffrey of Ohio, W. L. Saunders of New York, W. H. Withington of Michigan, and Robert Laidlaw of Ohio, all advanced strong arguments in favor of reciprocity, or gave business experiences demonstrating the desirability of more elastic commercial relations with foreign countries. Owen Osborn of Philadelphia, manufacturer of knit goods, opposed the French treaty, stating that the proposed reduction of 20 per cent. on French knit goods meant the destruction of the industry he represents, employing 100,000 persons, and established in many States of the Union.

A resolution by Mr. Laidlaw that the subject be referred to the Executive Committee for immediate consideration was referred to the Committee on Resolutions.

The convention adjourned.

Tuesday evening was devoted to an illustrated address by Dr. W. H. Talman of New York, secretary of the League of Social Service, his subject being "What More Than Wages?" The lecture was an exceedingly interesting presentation of the efforts made by manufacturers in Great Britain, Holland, Germany and the United States to surround their employees with greater comforts, provide them with better houses, and in general to direct their attention to the improvement of their mode of living. The doctor stated that within the past year some large corporations had appointed an official whose duties are those of a social secretary, to take charge of matters of this kind and conduct them systematically.

WEDNESDAY MORNING.

The Wednesday morning session opened with a continuance of the discussion of commercial reciprocity. W. H. Withington of Michigan said that the time had come for business considerations to govern the tariff question, instead of political interests. Since coming to this convention he had learned that in many branches of manufacture tariff protection is no longer needed. The branch of industry he represents handled agricultural tools, does not need protection and has never asked for it. His company began to export 30 years ago and have had an export trade ever since. Therefore he favored reciprocity treaties, believing that we have nothing to fear from lowering duties if we can thus secure concessions from other countries and keep up our export trade.

W. L. Saunders of New York said that he was engaged in the manufacture of air compressors and general mining machinery, the principal product not being patented. He does not ask protection, but would prefer some duties taken off iron and steel products, looking upon them as a hindrance to business with foreign countries. He heartily favored reciprocity if duties cannot be reduced generally.

Wm. T. Wood of Massachusetts, speaking as a manufacturer of ice cutting tools, said he did not in any sense need protection. His people have been protectionists because they believed protection would be for the benefit of the wage earners.

J. S. Barnett of New York spoke for tanners of leather, stating that they do not need protection. Our high tariff invites retaliation and Congress should modify it.

J. J. Estey of Vermont, manufacturer of reed organs, said that his product being a luxury he was interested in protection as a means of keeping up working people's wages, but believed that reciprocity would be desirable.

George V. Cohen of New York, representing 54 lines of goods, as exporters, said that the fact that all these manufacturers are large exporters would indicate that they are not greatly in need of protection. He gave interesting facts in connection with the growth of the export trade under reciprocity prior to the passage of the Wilson tariff bill.

John Lindner of Pennsylvania said that the shoe manufacturers need no protection, finding the duty on hides the only impediment to a greater growth of their export trade.

J. A. Jeffrey of Ohio believes in protection and reciprocity, but we cannot have reciprocity unless we keep up protection. The question should be handled very judiciously.

G. A. Carlisle of Indiana, speaking for the vehicle manufacturers, said that they are in the field to stay and feared no foreign competition.

Oliver Williams of Pennsylvania said that it would not do to rest on such a feeling, that it was absolutely necessary that something should be done to keep open the avenues to foreign trade. He was willing to see some concessions in duties on the lines here presented for the benefit of American trade in general.

Henry Fairbanks of Vermont brought out a new point, saying that all business interests dread a general revision of the tariff, which would disturb everything. The negotiation of reciprocity treaties, however, would bring about a readjustment of tariff conditions now necessary without disturbing business.

E. B. Pike of New Hampshire said that his industry needs no protection, more than half the product being exported. The danger exists that if the present administration does not do something toward readjusting duties the free trade cry will be raised again and much greater damage done than by a reasonable adjustment in the line of reciprocity.

Fred. F. Smith of New Jersey for machine tools, Mr. Smith of Indiana for rubber goods, and M. Smith of Detroit for copper, spoke in succession in favor of practical action by this country which would avert the danger of a tariff war against us by foreign countries.

James S. Taylor of Ohio said that the tariff of this country would have to be revised or we will have business stagnation. Reciprocity will be too slow, duties must be cut down more quickly and more generally. America must be the liberal nation of the world at this great stage of its progress and take steps to encourage foreign trade.

The meeting adjourned for dinner. The convention will continue in session until Thursday morning.

The great conflagration at Jacksonville, Fla., involving losses placed by the New York *Journal of Commerce* at $10,565,000, swelled the total fire loss of the United States and Canada for the month of May to $22,380,000, as compared with $15,760,000 in May, 1900, and $9,692,000 in the same month of 1899. The aggregate of fire losses for the five months ended May 31, 1901, is estimated at $79,336,000, which is $2,500,000 below that of the corresponding period of 1900, but $20,000,000 more than in the first five months of 1899.

THE MACHINISTS' STRIKE.

Conditions Changed.

Hartford Conn.; Plainfield, N. J.

Conditions Unchanged.

Worcester, Waterbury, Bridgeport, New York, Wilmington, Baltimore, Pittsburgh, Chicago, Hamilton, Cincinnati, Milwaukee.

The strike of the machinists has settled down to a plain test of strength and endurance between the machinist himself and his employer. An impartial review of our reports shows that the demands of the men have in some cases been granted, but the vast majority of employers have insisted upon conducting their business as a co-partnership between themselves and their men. While concessions have been made we have heard of no case where the association has been recognized as a controlling factor in the situation. We have heard of no case, where the demands have been acceded to, in which the union has not been eliminated. In each instance where an agreement has been reached the only stipulation has been that the employer has insisted upon arbitrating with his men alone, and independent of any outside interference.

That the trouble will not be settled by a "waiting match" is shown by the attitude of firms in certain localities, who have posted notices to the effect that their men must return to work or be considered as discharged. The date fixed for this is Monday next.

Navy Work Affected.

WASHINGTON, D. C., June 4, 1901.—Important developments of the past week in the strike situation have been the receipt by the Navy Department of notice from nearly all the leading shipyards in which war vessels are being constructed that contractors propose to take advantage of the strike clause in their contracts, and the extension of the strike to the shops of the Southern Railroad, which has its main office in this city. The headquarters of the International Machinists' Association in this city have remaned closed durng the week, owing to the absence of President O'Connell and members of the Executive Council at the Toronto convention.

The principal shipyards now building war vessels are so seriously affected by the machinists' strike as to cause considerable concern to officers of the Navy Department with regard to the progress on the vessels now in course of construction. Until within a comparatively short period the Government has made no allowance for delays caused by strikes and has remitted no penalties on that account. All existing contracts, however, carry a strike clause concerning delays, which reads as follows:

"Provided, however, that such delay shall not have been caused by the act of the party of the second part (the Government), or by fire, or water, or by any strike or standout of workmen employed in the construction of the vessel, or by other circumstances beyond the control of the party of the first part; but such circumstances shall not be deemed to include delays in obtaining materials when such delays arise from causes other than herein specified; and provided, further, that in case of any such alleged delay the party of the first part shall give immediate notice thereof in writing to the Secretary of the Navy."

The first notice received by the Navy Department came from the Union Iron Works of San Francisco, who are building the battle ship "Ohio," the armored cruisers "California" and "South Dakota," the protected cruisers "Takoma" and "Milwaukee," the monitor "Wyoming," and torpedo boat destroyers "Paul Jones," "Perry" and "Preble," and the submarine torpedo boats "Grampus" and "Pike." The situation on the Pacific Coast has been serious for some weeks, and the Department therefore was not surprised at the receipt of notice from the Moran Bros. Company of Seattle that advantage would be taken of the strike clause. This firm are building the battle ship "Nebraska," but at the date of the last monthly report on progress of construction made no claim that the building of the vessel actually had begun.

The Newport News Ship Building & Dry Dock Company notified the Department on the 1st inst., as the result of the decision of all the machinists to strike at 8 o'clock on the morning of the 3d inst. A telegram from Newport News states that all but one or two machinists went out according to the programme, the number of strikers being about 500. Superintendent Post states that there is no grievance of any kind against the yard, and that the demand is little less than highway robbery and could not be granted, even if the company were disposed to make the concession, because of the status of other departments. The Newport News Company are building the battle ship "Illinois," which will make her trial trip on the 8th inst. in spite of the strike: the battle ship "Virginia," the armored cruisers "West Virginia" and "Maryland," the protected cruiser "Charleston" and the monitor "Arkansas."

The Lewis Nixon shipyard has also notified the Department that its men have struck and that indefinite delay may ensue. This yard is now building the protected cruiser "Chattanooga," the monitor "Florida," the torpedo boats "Nicholson" and "O'Brien," and the submarine torpedo boats "Plunger," "Adder," "Moccasin," "Porpoise" and "Shark." The Maryland Steel Company have also filed a notice that their shops have been affected by the strike. This company, who only recently became a competitor for war vessel construction, are now building the torpedo boat destroyers "Truxten," "Whipple" and "Worden." These vessels are all about 67 per cent. completed, and, owing to their complicated machinery, it is assumed at the Navy Department that the strike has brought their construction to a standstill.

There is absolutely nothing the Government can do in the matter, in view of the notice received from the contractors under the strike clause, but the yards will not be permitted to assign to the strike any delays which may have occurred as the result of other causes. The officials will not be surprised should the strike in the shipyards prove protracted, as it is expected the shipbuilders will stoutly resist a demand to concede what would mean the placing of their entire establishments on the nine-hour basis at once, notwithstanding the fact that all pending contracts, some of which run for two years or more, were taken on the basis of a ten-hour day.

THE SOUTHERN RAILWAY.

The strike in the shops of the Southern Railway has been observed here with special interest, for the reason that it was one of the first of the railroads to be selected by the Machinists' Association for attack, and also because of the prompt and emphatic manner in which the strikers' demands have been rejected by Vice-President Gannon, who has charge of the operation of the road. The trouble in the shops of the Southern began on the 25th ult., when a delegation called on Vice-President Gannon and demanded that he sign the association's agreement relative to a nine-hour day with ten hours' pay, &c. Mr. Gannon refused to consider the agreement, and subsequently the delegates telegraphed to a representative in the shops at Charleston to "poll the shop." This dispatch was missent by a telegraph oper-

ator so that it read "pull the shop," upon which all the men went out, supposing that to be the intention of the delegates. Mr. Gannon thereupon wired the superintendent of the Charleston shops that the company would overlook the action of the men taken under a misapprehension if they would at once return to work, but that all who failed to report would be discharged unless reasonable excuse for absence could be given. Mr. Gannon's conference with the delegation had been taken down stenographically, and was immediately printed in pamphlet form and distributed to every machinist in the employ of the company, accompanied by the following notice:

"All shop men.—My meeting with the machinists' committee lasted three hours and 15 minutes yesterday. With the exception of a few indiscreet remarks made by three of the members, I was led to believe that we were making satisfactory progress and removing all possible causes for dissatisfaction or misunderstanding, when the chairman informed me that they had no authority to discuss any of the matters referred to, excepting the proposed contract with the I. A. of M. Three of the members seemed to think they were in full control and could have everything done as they might dictate. They went so far as to say that they would close the shops. This, of course, brought the meeting to a close.

"The management, believing in the intelligence and honesty of purpose of the shop men, has no fear as to what action they will take under such circumstances. The unreasonable action of the misguided committeemen, who seemed to think that they should present the dictates of an outside organization rather than the views and wishes of our men, has possibly put the matter in such shape as to lead to a misunderstanding. This communication is sent to you to guard against such a result. The proceedings of the meeting will be sent to you to-morrow, and if, after reading them, you consider it desirable to have another meeting, it will be my pleasure to so arrange. FRANK S. GANNON."

Notwithstanding the efforts of Mr. Gannon to clear up all misunderstandings of the men, practically all of the machinists, helpers and apprentices have gone out.

W. L. C.

The Chicago Conference.

The most important and far reaching action taken by the Administrative Council of the National Metal Trades Association, at its conference in Chicago on May 28 and 29, was the unanimous adoption of a declaration of principles, which not only completely abrogates the New York agreement, but paves the way for the formation of the strongest and most powerful organization of machinery manufacturers and iron concerns yet seen in this or any other country.

These principles, as adopted without a dissenting vote, also do away entirely with future national agreements between machinery manufacturers and employees; completely lose to the latter all ground gained by the New York agreement, and throw each city or individual shop upon its own circumstances and resources as to future dealings with employees. Conferences between employers and employees will be without reference to, or admission of, business agents, national unions or the representatives of such in settling local questions that may arise from time to time.

The new declaration of principles was immediately followed by the application for membership in the National Metal Trades Association of a large number of concerns throughout the country, which have heretofore stood aloof from the national body. As soon as it was declared adopted applications were handed in from local concerns at Saginaw, Mich.; Bay City, Mich.; Dayton, Ohio, and Cincinnati, Ohio, and from other sections in Michigan and Ohio. Before final adjournment it was found that fully 80 per cent. of the machinery manufacturing concerns of the country were practically members, their final identification with the same being merely a matter of a formal vote.

A NATIONAL CONVENTION.

A national convention of the Metal Trades Association was also called, by the Administrative Council, to be held in New York on Tuesday, June 11, for the purpose of further considering the important questions involved in present conditions, and to consider any matter which may be brought up between now and that date. At this meeting the declaration of principles will be unanimously ratified as the chief work of the Administrative Council at its Chicago meeting.

Immediately after the unanimous adoption of the declaration of principles the following formal announcement was telegraphed to each member of the national association:

"*Whereas*, The National Metal Trades Association and the International Association of Machinists formally entered into an agreement on May 18, 1900, for the express purpose of avoiding strikes and lockouts by arbitrating all disputes between employers and employees, and

"*Whereas*, It was specially agreed that pending arbitration there should be no strikes or lockouts;

"*Whereas*, In direct violation of that agreement the International Association of Machinists has refused arbitration and has officially ordered and instituted strikes in many shops of the members of the National Metal Trades Association, be it

"*Resolved*, By the Administrative Council in session in Chicago on this the 28th day of May, 1901, that the International Association of Machinists has wilfully violated its agreement of May 18, 1900, and, having made the same null and void, the agreement is no longer binding on the National Metal Trades Association."

THE CHICAGO DECLARATION.

Following is the text of the declaration as adopted by the Administrative Council without a dissenting voice:

"We, the members of the National Metal Trades Association, declare the following to be our principles, which shall govern us in our relations with our employees:

"1. Since we as employers are responsible for the work turned out by our workmen, we must therefore have full discretion to designate the men we consider competent to perform the work and to determine the conditions under which that work shall be prosecuted. The question of competency of the men being determined solely by us, and while disavowing any intention to interfere with the proper functions of labor organizations, we will not admit of any interference with the management of our business.

"2. Disapproving absolutely of strikes and lockouts, the members of this association will not arbitrate any question with men on strike. Neither will this association countenance a lockout on any arbitrable question unless arbitration has failed.

"3. Employment. No discrimination will be made against any member of any society or organization. Every workman who elects to work in a shop will be required to work peaceably and harmoniously with all his fellow employees.

"4. Apprentices, helpers and handy men. The number of apprentices, helpers and handy men to be employed will be determined solely by the employer.

"5. Methods and wages. We will not permit employees to place any restriction on the management, methods or production of our shops, and will require a fair day's work for a fair day's pay. Employees will be paid by the hourly rate, by premium system, piece work or contract as the employer may elect.

"6. It is the privilege of an employee to leave our employ whenever he sees fit, and it is the privilege of the employer to discharge any workman when he sees fit.

"7. The above principles being absolutely essential to the successful conduct of our business, they are not subject to arbitration. In case of disagreement concerning matters not covered by the foregoing declaration we advise our members to meet their employees, either

individually or collectively, and endeavor to adjust the difficulty on a fair and equitable adjustment. We advise that they submit the question to arbitration by a board composed of six persons, three to be chosen by the employer and three to be chosen by the employee or employees. In order to receive the benefits of arbitration the employee or employees must continue in the service and under the orders of the employer pending a decision. In case any member refuses to comply with this recommendation he shall be denied the support of this association unless it shall prove the action of said member.

"8. Hours and wages. Hours and wages, being governed by local conditions, shall be arranged by the local associations in each district. In the operation of piece work, premium plan or contract now in force or to be extended or established in the future, this association will not countenance any conditions of wage which are not just, or which will not allow a workman of average efficiency to earn at least a fair wage."

STATEMENT BY PRESIDENT REYNOLDS.

Edwin Reynolds, president of the National Metal Trades Association, is quoted in a Milwaukee paper as making the following statement:

"We laid down our platform and it speaks for itself, so far as the future action of the National Metal Trades Association is concerned. It means just what it says. It means, in effect, that the national organization of machinists, through its president, having declined to arbitrate questions at issue, as plainly arranged for under the New York agreement of last year, that agreement is null and void; that the Metal Trades Association cannot and will not longer recognize it as binding in any of its features, and that each concern in the national organization will hereafter settle their own questions with employees locally, and without reference to the national association of workers of any class in the various trades. I wish right here to correct an erroneous impression which has got abroad relative to the proposition for local arbitration in Chicago, and which failed of its purpose: That movement was made entirely by local individuals and not by the Administrative Council. We, as a council, had nothing whatever to do with the request telegraphed President O'Connell. We did not ask him to arbitrate the Chicago or any other matter, and in his telegraphed reply he fully recognized the fact that the request had not come from the National Association or its Administrative Council. He said in that reply that he had named local parties to arbitrate with the local interests which sent the request to him. That request to O'Connell went from the local lodge of machinists in Chicago, and we had nothing to do with it. It would have been wholly inconsistent for the Administrative Council to have asked for local arbitration for Chicago, whether that move would have in any way affected other cities or not, for the simple reason that the National Association proposed arbitration to President O'Connell at the start, and he refused. That settled it with the Metal Trades Association. We would not and could not, consistently, have asked for it in the Chicago case.

"The Administrative Council did not discuss the question of a compromise offer, and nothing was said or done relative to 12½ per cent., 6¼ per cent. or any other percentage of advance. The only thing actually done, and the only thing of real public interest and importance, was the adoption of these principles—our platform—and upon that we stand as a national organization. The platform was first read section by section and paragraph by paragraph, and each item was voted on separately. Then it was voted on as an entirety, and neither when read item for item nor as a whole was there a single dissenting vote against it. It was the unanimous instrument of the Council. Immediately after it was adopted a large number of representatives of firms not in the association heretofore filed their applications for membership, stating that they would unite under such conditions as set forth in our declaration.

"I cannot, of course, say how long the present strike may last. That is purely problematical, but all interested men will be able to see exactly where the manufacturers stand, and where they will stand in the future—without the New York agreement to cut any figure. We will hereafter deal solely with our own men; will settle disputes in our own family, and if arbitration is best, that will be carried on between each concern and their own men. We have no question to raise with unions, save that we shall deal with the men as our own employees, and not with outsiders any more. A national convention of the Metal Trades Association has been called for June 11. It will be held in New York, and matters of importance and interest to all members will be fully considered at that time. There will be no conference further with national officers of workmen."

BOSTON, MASS., June 1, 1901.—The management of the Atlantic Works in East Boston states that reports of the number of men who went out on strike from the establishment were greatly exaggerated. Instead of upward of 100 men, as was currently reported, the strikers were only a little more than one-third of that number, according to the concern's statement.

About 400 of the strikers who were employed at the works of the Blake Pump Mfg. Company in Cambridge held a meeting on May 31, and voted not to return to work until the company granted their demands. To-day there was a conference between the Blake Company officials and the Executive Committee of the striking machinists, but the company absolutely refused to consider any proposition from the men, stating that if they desired to return to work under the old ten-hour day conditions, however, they would be taken back. The strike committee's proposition was for a nine-hour day, 12½ per cent. increase in wages, all the men to be accepted on their return to work without discrimination, and all grievances to be submitted to arbitration.

BOSTON, MASS., June 3, 1901.—Golding & Co. have granted the 40 machinists in their employ a nine-hour day and 12½ per cent. increase in wages. The local committee estimates that about 2200 machinists in Boston and vicinity have now secured the concessions requested, while 1100 are out on strike, including those from the Blake Pump Works, where the most stubborn contest between employers and men is in progress; the Atlantic Works, scheduled by the union as having upward of 100 men out, although the concern's figures by no means coincide; Holmes & Blanchard, the Boston Woven Hose & Rubber Company and the Goodyear factory of the United Shoe Machinery Company.

It is announced that to-night the machinists of Salem, Mass., will be organized, preparatory to demanding the nine-hour day in that city. The railroad machinists in the employ of the Boston & Maine and New York, New Haven & Hartford roads are also reported as organizing for a similar purpose. At the big shops in Norwood, Mass., the men have been joining the union rapidly of late.

In Cambridge, at the Roberts Iron Works, 40 boiler makers presented last week a demand for a 54-hour week, and this was granted to them on Saturday, June 1.

The Situation at Providence.

Up to a late hour Tuesday night the strike at the Corliss Steam Engine Company branch of the International Power Company, among the machinists, was still unsettled. The strikers were firm in the determination to remain out until the demands of the union are agreed to by the company, and from all that can be learned from the officials of the corporation the company are equally as determined not to give in to the association.

The strikers at the Providence Engineering Works went to work again last Friday morning. An agreement was reached between the company and the men, who were on strike, and the difficulty was adjusted to the satisfaction of all parties. Richard H. Rice, treasurer and general manager of the company, said that the curious feature of that strike was the fact that the men made no demands in person upon the company previous to leaving work. "On the morning the machinists

went out," said Mr. Rice, "a man came to see us in the office, and claimed to represent the machinist employees. Almost before he had fully stated what he wanted the men began to stop work, and in a few minutes the strike was on. There were 114 men who went out, and there were several others who were out sick and could not take a part. All these men are now working in their old places. The company from the first took the stand of dealing with the men and did not in any way recognize a union. We were willing at any time to meet the workmen as workmen, but not as members of a union, and throughout the entire time we abided by this decision. We had three meetings with the committee appointed by the strikers to confer with us, and on Tuesday evening of last week we were notified that the men would return to their work on the next Friday. No agreement has been signed officially, as we were positive that the men would do the right thing by us, and they were certain that we would do the same by them. We did draw up an agreement, which was agreed to by both sides, but it must be distinctly understood that the company did not at any time take any cognizance of a union or association."

The agreement follows:

"1. We will operate our works on a schedule of 54 hours per week for day men as follows: Nine and three-quarters hours for the first five days of the week and five and one-quarter hours on Saturday.

"2. For reasons already stated, we can make no change in rate of wages at this time.

"3. We will pay one and one-half time for overtime up to 12 p. m., and double time after 12 p. m., and on Sundays and holidays, except for work on our own plant, for which work the present rates are to continue unchanged.

"4. We will arrange a 59-hour week for night men.

"5. We cannot agree to limit the number of apprentices.

"6. All employees will be reinstated in their former positions without discrimination.

"7. Every man must pledge himself not to participate in any strike hereafter without first having submitted any requests which he may have to make, and which would form the basis of a strike, to the attention of the management and received a reply from it. The management on its part pledges itself to make reply as soon as the magnitude of the matter and its due consideration will permit.

"8. All men now at work for us must be retained after the termination of the strike, and no discrimination in the nature of disagreeable treatment, or otherwise, shall be used against them, and any infringement of this shall be considered a cause for immediate discharge."

These two plants, the Providence Engineering Works and the Corliss Steam Engine Company, were selected by the union to make the fight, which the organization hopes will bring Providence machinists in line with the workmen in other cities where the matter has been agitated. The return to work of the strikers of the Providence Engineering Works was at first thought to be a victory for the association, but a careful reading of the agreement shows that the company did not give in to a great extent. Some of the Corliss strikers are now regarding the men who returned to work at the other plant as being disloyal to the union, inasmuch as they compromised with the company and broke the strike by allowing the officials to postpone action on the matter of wage schedule for several months.

In the other shops in Providence there is but little fear on the part of the managements of a strike, as the union membership is scattered about considerably, and is not of alarming strength in any one establishment. It is the claim that the total membership in the city is about 3500, but of these there are many who are somewhat lukewarm in their attitude.

Hartford.

The Pratt & Whitney Company have been working 55 hours and have granted the 54 hours with the same pay.

A dispatch received from the Billings & Spencer Company says: Practically all factories are now running. The men returned on the basis of nine-hour day and ten-hour pay and recognition of shop committee, composed of employees only. No recognition of unions conceded. Some shops are running nine hours per day and some ten hours and half holiday Saturday.

The Electrical Vehicle Company say: "We granted employees terms as set forth in your letter."

Cushman Chuck Company say: "Machinists are all back; nine-hour day, ten hours' pay; shop committee to be recognized; no agreement with unions."

From the Pratt & Cady Company we have just received the following:

"We started machine shop Monday full handed, nine hours per day, same pay as for ten hours continued; agree to always receive committee of our men only; did not sign papers of any kind."

Under date of May 29 the Farrel Foundry & Machine Company of Ansonia write us as follows:

"There has been no change in Ansonia. You outlined our position in your last issue. We used our best efforts to get our men to arbitrate before they went out. As we did not succeed in that direction we do not propose to do anything further in the near future, but simply to await developments. The next proposition must come from them rather than from this firm."

New York.

The situation in New York remains practically unchanged. The Garvin Machine Company are working with a reduced force, but are independent of the union. No change has occurred at the works of R. H. Hoe & Co., or with any of the other printing press manufacturers, as far as we have been able to learn.

The Crocker-Wheeler Electric Works, at Ampere, N. J., are being operated with non-union men. The firm are determined to ignore the union.

At Plainfield, N. J., the Aluminum Plate & Press Company have resumed work on a 54-hour basis, but with the proviso that the final rate of wages shall be the same as that paid by the other shops in the city when their difficulties have been settled.

At the works of the Pond Machine Tool Company the following notice was posted:

"Notice is hereby given that all machinists not reporting for work on or before June 10, 1901, will be considered as no longer in our employ, and are requested to call for their pay and remove their tools by the date given. All concessions heretofore granted are canceled."

We have received a significant dispatch from the Gleason Tool Company of Rochester as follows:

"Knowlton & Beach and Gleason Tool Company are still asking for arbitration; the local union is in favor of it, but the national officers have so far refused to allow it."

The Iroquois Iron Works of Buffalo say:

"In answer to your favor of May 27, would say that with the Natonal Metal Trades Association we were party to a New York agreement with the International Association of Machinists. On Tuesday, May 21, they went on a strike in these shops, thereby breaking their agreement. Our position from the moment they went on the strike has been that we would make them no proposition, would give them no answers until they returned to the shop, and after they had returned to work the question of wages would be taken up and adjusted with each man individually, but no flat increase would be allowed. Further, they were informed that as they had broken their agreement we were no longer bound to the nine-hour day, and we would give them no answer in regard to the question of hours, but would determine as to the number of hours that would constitute a day's work in these shops ourselves and that they would have to be guided by it accordingly; we were to inform them the result when we had so determined. The men, therefore returned to work on exactly the same basis they left it and have not as yet received our answer as to what will constitute a day's work. They have broken their agreement, we are free to determine, and will in future so determine, the shop hours."

Under date of June 4 the Niagara Machine Tool Works of Buffalo write us: "Since last week the men of the Howard Iron Works and West Mfg. Company returned to work, a compromise having been effected, amounting practically to an advance in wages. At a meeting of the members of the Buffalo Association of Machinery Manufacturers yesterday it was decided to post the following notice to-morrow in all shops, including those where the men had returned to work:

"*Notice.*—The working hours in all departments of these shops will hereafter be on the basis of ten hours per day: 7 a.m. to 12 noon—12.30 p.m. to 5.30 p.m., making a total of 60 hours per week. Overtime will be paid for only after 5.30 p.m."

The Situation in Philadelphia.

PHILADELPHIA, PA., June 4, 1901.—The situation of the striking machinists in this city is practically unchanged. The larger concerns who have been affected still maintain their original position, and in several cases it is reported that the new men to take the place of the strikers are being obtained without very great difficulty. The smaller manufacturers, however, are generally acceding to the demands of the men. Several employing from four to ten men are reported to have agreed to the men's wishes during the past few days. Several settlements of note have been made during the week, that of the Pennsylvania Iron Works, 200 men, being the most notable.

The demands of the union appear now to be confined to the manufacturers employing only a small number of machinists, and no additional strikes have taken place as yet among the more extensive shops.

Among the nine-hour shops in Philadelphia may be mentioned:

Searchmont Motor Company, Orkney street.
Chicago Pneumatic Tool Company, Olney.
*Neafie & Levy, Beach and Palmer streets.
Stokes & Parrish, Thirty-first and Chestnut streets.
Harrison Boiler Works, Seventeenth and Clearfield streets.
Smith, Drum & Co., Coral and Cumberland streets.
Allen, Fifth and Glenwood avenue.
*Alfred Box, Front and Poplar streets.
Simpson, Fifth and Buttonwood streets.
Fred. Gleim, Eleventh and Hamilton streets.
*Tabor Mfg. Company, Eighteenth and Hamilton streets.
Reilly & Ferron, Third and Girard avenue.
E. H. Johnson, Camden.
Edco Electro-Dynamic Company, Ionic street.
Penn Iron Works, Fiftieth and Lancaster avenue.
Scott & Williams, Cumberland and Amber streets.
Solomon, Sansom street.
De Long Hook & Eye Company, Eleventh and Buttonwood streets.
American Addo Company, 911 Vine street.
Tinius Olsen, Buttonwood street.
Parsons & Sons, Twenty-sixth and Poplar streets.
Wooten & Peckworth, Front and Vine streets.
G. Oldham & Sons, Tackawana street, Frankford.
Beetcher & Co., Tackawana street, Frankford.
McKellar, Smiths & Jordan, Seventh and Sansom streets.
Hugo Bilgram, Twelfth and Noble streets.
Sprague, Filbert street.
Falkenau, A., Twenty-second and Cherry streets.
*Link-Belt Engineering Company, Nicetown.
Hartnett, Sixth and Arch streets.
*Philadelphia Pneumatic Tool Company, Eleventh and Noble streets.
Morse & Williams, Frankford avenue and Wildey street.
Albro Clem Elevator Company, Seventh and Glenwood avenue.
Carver, 25 North Seventh street.
Mayo, Seventh and Filbert streets.
*Kellar Pneumatic Tool Company, Eleventh and Ridge avenue.
Electric Storage Battery Company, Eighteenth and Allegheny avenue.
Exchange Machine Company.
Hess & Barker, Darien street.
Philadelphia Machine Tool Company, Darien street.
Philadelphia Gear Company, 618 Race street.
Ott, Second and Buttonwood streets.
New York Filter Company, Eighteenth and Hamilton streets.
Foullard Machine Company.
A. H. Reed Creamery Company, Thirtieth and Market streets.
Kensington Engine Company, Vienna and Beach streets.
Tacony Iron Company, Tacony.
H. B. Underwood, 1015 Hamilton street.
National Knitting Machine Company, Eighth and Cherry streets.

Those indicated by * have either been working on the nine-hour a day plan and were not affected by the strike, or as in the case of the Tabor Mfg. Company made only a nominal advance in wages.

The situation in Philadelphia, Wilmington and Baltimore remains practically unchanged. No important change of any kind is to be noted.

The S. Morgan Smith Company of York, Pa., say: "The machinists in our establishment are on a strike and at the present time no settlement with them has been made. We refuse to acknowledge their union. In fact would not consider any one article of their agreement."

The York Mfg. Company state: "In reply beg to say that we are gradually filling the places of the men who went out with new men, and some few of our men who went out have returned to work on the old basis; otherwise the situation remains practically the same as at the time of our previous report."

The following has been received from the Allis-Chalmers Company, successors to the Dickson Mfg. Company, of Scranton, Pa.: "In reply to your telegram of this afternoon, would say there has been no change in the condition of the labor situation at this place. The machinists and allied associations are out, and every iron manufacturing industry in the city not employing Amalgamated Association men is tied up, including the shops of the D. L. & W. R. R."

The Morgan Engineering Company of Alliance, Ohio, say: "The strike was of but two days' duration, Monday and Tuesday, the 20th and 21st, the men all returning to work on the 22d without any concessions whatever, except advance of 10 per cent. in wages, which we had granted to those who had remained loyal."

The American Blower Company of Detroit say: "We beg to advise you that the situation has not changed since we wired you last week. Some few of our less skillful machinists have left us, but we have had no demand made upon us by our men, nor do we anticipate such a demand being made."

The Detroit Shipbuilding Company say: "Our machinists are returning to work daily, and we expect to have the shops in full operation the first of the coming week. This company have signed no agreement."

The Strike Situation in Chicago.

The arbitrators who were attempting to effect a settlement for the Chicago district when we went to press last week failed to accomplish anything. Propositions and counter propositions were made, but everything hinged on a 10 per cent. advance in machinists' wages to date from May 20, which the representatives of the machinists insisted on. This the manufacturers would not concede, and the negotiations ended the same evening (29th ultimo). W. J. Chalmers of the Allis-Chalmers Company, who had been one of the most active manufacturers in the fight for arbitration, said at the conclusion of the negotiations:

"The demands of the men were simply outside the bounds of reason. To concede them would mean that we would be forced out of business. This can be better understood when it is stated that many shops have, since May 1 last year and May 20 last, made advances of wages running from 10 to 12½ per cent. In our shops the advance has been from 5¼ to 18 per cent. In spite of this the members of the union now demand a further increase of 10 per cent., which, taken in connection with the shortening of the hours of labor, would mean an increase in the cost of products of about 30 per cent. We couldn't stand it and do business, that is all."

The following day being Decoration Day and a legal holiday, no action was taken by the machinists. On Friday morning an ultimatum in the form of an agreement was presented to each employer, calling for an increase of 12½ per cent. in wages over those paid May 20, a nine-hour day and the other revised regulations with which the trade is familiar. Nearly all employers at once refused to grant these terms and their men walked out at 10 o'clock. In a few instances, however, such as Greenlee Brothers, Charles F. Elmes Engineering Works, Link-Belt Machinery Company, Webster Mfg. Company, H. W. Caldwell & Son Company and perhaps some others, the employers were able to make such terms with their men that they continued at work.

It is understood that these terms were usually to adopt the nine-hour day with an advance in wages of 5 to 7½ per cent. over the hour rate in effect May 20. In these instances the mandate of the union was not obeyed, the men in each establishment acting for themselves. It is a provisional arrangement, and will probably be changed to conform to whatever result may be reached by the National Metal Trades Association.

The Situation in Chicago.

CHICAGO, ILL., June 4, 1901.—(*By Telegraph.*)—There is little change in the machinery situation in District No. 52. The Chicago Association of the Machinery Manufacturers, which is independent of the National Metal Trades Association, met to-day and adopted the following resolutions:

"*Whereas*, At a recent meeting of the National Metal Trades Association, held in Chicago, the Arbitration Committee, members of the National Metal Trades Association, met with an Arbitration Committee, members of the International Association of the Machinists, and failing to come to an agreement adjourned;

"Now, therefore, we, the machinery manufacturers of the Chicago district, hereby pledge ourselves to stand by the action of the National Metal Trades Association in their refusal to grant a 12½ per cent. advance in wages, and agree to await the results of the meeting of the National Metal Trades Association, to be held in New York City June 11 next, and pending such agreement will make no concessions in Chicago in the wage scale, excepting in our factories."

They also elected the following gentlemen to lay the situation of the machinists' strike in Chicago before the next meeting of the National Metal Trades Association: W. J. Chalmers of Fraser & Chalmers, J. J. Walser of Goss Printing Press Company, W. B. Pearson of the Pearson Machine Company, and Geo. E. Eagen of the F. W. Wolf Company.

The Declaration of Principles of the Administrative Council of the National Metal Trades Association was indorsed before the above resolutions were adopted.

On Saturday last the position of the Chicago shops was as follows:

Chas. F. Elmes Engineering Company: Mr. Elmes stated that the demand had been made to them for 12½ per cent. increase; that after considerable discussion he had offered 5 per cent. increase. The men went over to see Mr. Roderick, who wanted them to walk out. They had some dispute and he told them they would have to fix it up themselves, and they finally voted to remain at 5 per cent. increase. We are advised by telegraph, however, that this settlement seemed to be unsatisfactory to the men, and a walkout is now imminent.

Goss Printing Press Company: All the machinists walked out at 10.30 a. m.

Robt. Tarrant Machinery Company: All men walked out at 9.30 a. m.

Miehle Printing Press Company: All men walked out at 10.30 a. m.

Greenlee Bros.: The men all went out; they refused to sign the agreement which they presented, but the men came back at their old rate, and they said they would use their judgment about increasing them individually, and do what they thought proper.

F. W. Wolf Mfg. Company: All out at 10 a. m.

Chicago Ship Building Company: All men out.

A. Plamondon Mfg. Company: No demand made by the men; all at work.

Adams & Westlake Company: All men at work.

F. C. Austin Mfg. Company: All men at work.

Chisholm, Boyd & White Company: All at work.

Whiting Foundry & Equipment Company: All at work.

M. C. Bullock Mfg. Company: All out at 10 o'clock.

Pearson Machine Company: Men still at work.

W. R. Perrin: Men still at work.

Weir & Craig: Men still at work.

W. A. Jones Machine Company: No demand made; men still at work.

Chas. Kaestner & Co.: All out at 12 o'clock.

John Davis Company: Not out. They stated they had made substantial increase to their men several months ago, and had been virtually working on a nine-hour day. They did not expect a walkout.

Illinois Screw Company: (2 p. m.) Men still at work; expect them to go out in a few hours. They stated that Walburn-Swenson's men had all gone out.

Garden City Fan Company: Men all out.

Latham Machine Company: All out at 10 a. m.

National Machinery Company: Men still at work.

Reedy Elevator Company: Men have been on strike since February 23.

The Situation in Milwaukee.

Under date of June 3 the machinery manufacturers of Milwaukee issued the following notice to employees:

"Notice is hereby given that all employees who have left their work since May 18, 1901, must report for duty on or before 7 o'clock a.m., Monday, June 10, 1901. Failing to so report they will be considered as no longer in our employ and are requested to call for their pay and remove their tools on or before Saturday, June 15, 1901."

The following firms have signed the Declaration of Principles:

Allis-Chalmers Company.
The Filer & Stowell Company.
Christensen Engineering Company.
The Bucyrus Company.
The Vilter Mfg. Company.
Pawling & Harnischfeger.
Fred. M. Prescott Steam Pump Company.
Milwaukee Harvester Company.
Sheriffs Mfg. Company.
The Browning Mfg. Company.
Kearney & Trecker.
The Kempsmith Mfg. Company.
The Falk Mfg. Company.
Barth Mfg. Company.
B. Hoffman Mfg. Company.
Philip Schwab.
Pfeiffer & Smith.
Chain Belt Company.
The Prinz & Rau Mfg. Company.
Milwaukee Electric Company.
Lutter & Gies.
The Mechanical Appliance Company.
Doelger & Kirsten.
Logeman Bros.

THE MILWAUKEE SHOP RULES.

The Milwaukee manufacturers have adopted the following shop hours:

Beginning Monday, June 10, 1901, and continuing until further notice the day gang will work 55 hours per week during the months of June, July, August and September (summer schedule), and 59 hours per week for the remaining eight months of the year (winter schedule).

Summer Schedule, beginning June 1.—Day Gang.—55 hours per week. Five days of ten hours each and one day of five hours. From 7 o'clock a.m. to 12 noon, from 1 o'clock p.m. to 6 p.m., Mondays, Tuesdays, Wednesdays, Thursdays and Fridays. From 7 o'clock a.m. to 12 noon, Saturday only.

Overtime.—All time worked after 6 p.m. Mondays, Tuesdays, Wednesdays, Thursdays and Fridays, and after 12 noon Saturdays, up to 12 midnight, will be paid for as overtime at the rate of time and one-half. All time worked after 12 midnight, and Sundays and legal holidays, will be paid for at the rate of double time, with the exception of company repair work, which will be paid for at the rate of time and one-half.

Winter Schedule, beginning October 1.—Day Gang.—59 hours per week. Five days of ten hours each and one day of nine hours. From 7 o'clock a.m. to 12 noon, from 1 o'clock p.m. to 6 p.m., Mondays, Tuesdays, Wednesdays, Thursdays and Fridays. From 7 o'clock a.m. to 12 noon, from 1 o'clock p.m. to 5 p.m., Saturday only.

Overtime.—All time worked after 6 p.m., Mondays, Tuesdays, Wednesdays, Thursdays and Fridays, and after 5 p.m., Saturdays, up to 12 midnight, will be paid for as overtime at the rate of time and one-half. All time worked after 12 midnight, and Sunday and legal holidays, will be paid for at the rate of double time, with the exception of company repair work, which will be paid for at the rate of time and one-half.

The above does not apply to the foundries, or to men regularly employed on night gangs, watchmen and draftsmen.

Night Gang.—Machine Shops.—Winter and Summer Schedule.—62½ hours per week. Twelve and a half hours per night. Five nights per week. From 6 p.m

to 12 midnight; from 12.30 o'clock midnight to 7 a.m. Night gang will not work Saturday nights.

Overtime.—When night men are required to work Saturday night until Sunday morning, time and one-half will be allowed. Night men will be allowed double time when required to work Sunday night until Monday morning.

Holidays.—New Year's Day, Decoration Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas are the only days recognized as legal holidays in the above schedule.

The Situation in Cincinnati.

CINCINNATI, OHIO, June 4, 1901.—(*By Telegraph.*)—By far the most important action taken by the local association of manufacturers was that taken at yesterday's meeting, indorsing and adopting without change the Declaration of Principles recently promulgated by the National Metal Trades Association at Chicago, and in this connection the local association appear to be staying quite firm, and for anything that appears on the surface to the contrary, they appear to be prepared for quite an indefinite shutdown, should the men so decide. Probably by far the larger proportion of the shops in Cincinnati are not excessively overrun with orders, and a shutdown for a few months or a continuation of the present shorthanded basis will not be altogether an undesirable happening, when viewed from a manufacturer's standpoint.

The following report has been given out by the Press Committee of the association: "The 37 shops represented in this association report 2562 men out on strike, or laid off, and 753 men still at work. From 32 machine shops outside this association there are still 321 at work and 357 out on strike. Together, out of a total of 3993 men employed in these 59 shops, there are 2919 men out on strike and 1074 men still at work, or 26.9 per cent. of the total number of men employed in these machine shops are still at work. We find that of the 35 shops of our association who have reported there are 1833 machinists and handy men out and 195 still at work; that there are 298 apprentices out and 10 still at work; that there are 391 miscellaneous employees out and 331 still at work. Two firms who have not classified their employees report that they have 51 out and 270 still at work. Fourteen firms of this association report on the rate of increase in pay between January 1, 1899, and May 1, 1901. The increases vary between 5 and 22.6 per cent., and based on the number of men employed, the average rate of increase amounts to 16.55 per cent. We find that ten firms outside this association employing 132 men are working 54 hours and paying for 60. One firm employing 75 hands works 57 hours and pays for 60. None of these outside firms, however, have signed the union agreement, but will abide by the action of this association. Two firms employing jointly 28 hands have signed a partial agreement."

The situation on the whole in Cincinnati does not appear to be changed, and everything is exceedingly quiet and orderly in and about the shutdown shops. Of course in a city the size of Cincinnati, 3000 or 4000 striking men cut a comparatively small figure to what they do in towns the size of Hamilton, Ohio, for instance, where the situation appears to be much more strained than it is here, in that the public recognition and support given the men who are out amounts to an almost practical recognition by the political and city officials.

The Situation at Hamilton.

HAMILTON, OHIO, June 4, 1901.—(*By Telegraph.*)—A meeting of the manufacturers of Hamilton was held at the office of the Niles Tool Works Company, June 3, 1901. Permanent organization was effected by the election of Mr. Cullen as chairman and Mr. Hooven, secretary. It was unanimously agreed that the following notice be posted in all the shops of the city, and a copy given to the daily papers both of Hamilton and Cincinnati and Dayton:

"Notice is hereby given that all machinists not reporting for work on or before Monday, June 10, will be considered as no longer in the employ, and are requested to call for their pay and remove their tools on or before date given. Notice is also given that all concessions before made are hereby canceled."

Niles Tool Works Company.
Hooven, Owens & Rentschler Company.
Advance Mfg. Company.
Hamilton Machine Tool Company.
Black Clawson Company.
Long & Allstatter Company.
Bentele & Margedant Company.

The Situation at Cleveland.

CLEVELAND, OHIO, June 4, 1901.—(*By Telegraph.*)—The machinists' strike situation is rapidly clearing. Theoretically speaking about 127 men are still on strike, but practically speaking from the manufacturers' standpoint only about 50 of the men out are still considered as employees. Only three shops are affected in any way. The 50 men employed by the Variety Works are still out, as are the 27 employees of the Cleveland Punch & Shear Company. The latter case, however, is a lockout, as the men were discharged on the indications of a strike and no effort will be made to fill their places for the present. Thirty of the 90 men lost by Warner & Swasey have returned to work, and it is understood that many of the others have taken their tools and secured work elsewhere. The company have secured a number of new men, and the shop is running with almost the usual force. The men who struck from this shop were all non-union men, and they demanded a nine-hour day, without reference to pay. The shop will probably be operated 55 hours during the summer months, as has always been done by the majority of the largest concerns in the city. F. B. Stearns & Co., automobile manufacturers, lost 18 men last week, but have discharged them and filled their places. Concerns needing more men are having little difficulty in securing them.

At a meeting of the Cleveland Manufacturers' Association, held Saturday, the following resolution was adopted:

"*Resolved*, That we fully approve of and indorse the resolutions and declarations of principles adopted at the meeting of the Administrative Council of the National Metal Trades Association, held at Chicago, May 28, 29, 1901."

It is stated that hereafter the local organization will be conducted as an organization of defense, and no questions will be arbitrated with men who are on strike.

A dispatch from the Gleavon Tool Company of Rochester, N. Y., under date of June 5, says: "Bridgeford's men struck again, also Palmers'. Question of hiring new men."

International Machinists' Convention.

A dispatch to the New York *Times* dated Toronto, June 3, says:

The annual convention of the International Machinists opened here to-day. The session promises to be important, as many questions of vital interest to the trade will be discussed, and settled if possible. About 200 delegates were present when President O'Connell called the meeting to order. Mayor Howland, on behalf of the city, extended a cordial welcome to the visitors, and expressed the hope that the strike would be settled to their satisfaction.

The Credentials Committee finished its work this afternoon, after which President O'Connell delivered his address. He showed that during the past two years 197 charters were issued, with a membership of 7404. During his term the executive had approved of 66 strikes, involving 9650 machinists, of which 41 were won, 10 settled on compromise and 10 lost. The locals engaged in 246 strikes, involving 12,192 men. Two hundred lodges reported having settled 759 grievances without a strike. Increased rate for overtime was obtained in 763 shops.

"A reduction in the hours of labor has been our hope since the association started," continued the president. "I am firmly convinced that our nine-hour movement will result in reducing the hours of labor for 150,000 machinists.

"Machinists employed in the railway service have

been more than anxious to take part in the movement on May 20, but we have felt that many roads could not be sufficiently prepared by that date, and have advised against such a move taking place, except in special cases. Very great progress has been made for the past three months by our organization with the railway machinists, and I recommend that a date be set for the inauguration of the nine-hour day for machinists employed in the railway service."

PERSONAL.

Frank Salmon has resigned as general manager of the Salmon Iron Works, Freeland, N. Y.

R. W. Irwin has been elected treasurer of the Smith Machine Screw Company, Northampton, Mass.

Joseph E. Schwab, general superintendent of the steel works and furnaces of the Carnegie Steel Company at Duquesne, Pa., has resigned and will accept the position of assistant to his brother, Charles M. Schwab, president of the United States Steel Corporation. Mr. Schwab will remove to New York about June 15. Azor R. Hunt, superintendent of the Homstead plate mills, has been appointed to succeed Mr. Schwab at Duquesne.

Sidney Taylor, the manager of the well-known Sandycroft Foundry, builders of mining machinery, near Chester, England, is now traveling in this country.

Charles McCrery, the well-known furnace manager, has decided to resign his post as general superintendent of the plant of the Dominion Iron & Steel Company, at Sydney, C. B.

Charles M. Jarvis, formerly president of the Berlin Iron Bridge Company of East Berlin, Conn., and later vice-president of the American Bridge Company, sailed on the "St. Louis" on Wednesday last for an extended tour through Europe, to be absent several months.

Arthur Keen and E. Windsor Richards have joined a party of members of the executive committee of the United States Steel Corporation in a tour of inspection of the properties of the company. The party consists of Judge Gary, Percival Roberts, E. C. Converse, D. G. Reid and William Edenborn.

John A. Johnson, president of the Fuller & Johnson and the Gisholt Machine companies of Madison, Wis., has changed his name to John A. Johnson Gisholt.

James Beldin has been appointed assistant to D. H. Bacon, chairman of the board of directors of the Tennessee Coal, Iron & Railroad Company, effective June 1, and will have his headquarters here. He is quite a young man, and formerly was assistant to the chairman of the board of directors of the Chicago & Eastern Illinois Railroad. It is understood that G. B. McCormick, general manager for the Tennessee Company, will devote himself especially to the coal interests of the company, Edwin Ball, formerly of the Minnesota Iron Company, being in charge of the iron ore property. W. R. Palmer, superintendent of the steel plant of the Tennessee Company at Ensley, retires on July 1. He will be succeeded by John McConnell of Pittsburgh, recently appointed assistant superintendent.

The Council of the Iron and Steel Institute has awarded Andrew Carnegie research scholarships of $500 each to John A. Matthews of Brooklyn, N. Y., a graduate of the Columbia School of Mines, New York; Alfred Stansfield of London, England, and Julius Goldberg of Leoben, Austria.

J. W. Wallace has been appointed receiver of the Jones Valley Iron Company, which operated the Williamson furnace at Birmingham, Ala., on lease.

It is reported that a company with a capital of $3,000,000 are organizing to build another shipyard on the Delaware River at Chester, Pa. State Senator W. C. Sproul of Delaware County, Pa., a son-in-law of the late John Roach, is heading the enterprise and is understood to have substantial interests at his back. The land optioned at Chester has a water front of 2400 feet with a depth of from 20 to 25 feet of water on the bulkhead line, so that vessels of large size can be docked.

MANUFACTURING.

Iron and Steel.

The American Iron & Steel Mfg. Company will make extensive improvements and erect new buildings at their plant at Lebanon, Pa.

The New Haven Iron & Steel Company have started work on a new rolling mill at their plant at New Haven, Conn. It will be one story high, 80 x 110 feet, of steel construction and covered with corrugated iron.

The Carpenter Steel Company, 1 Broadway, New York City, are installing the machinery for the new rolling mill at Reading, Pa., and in about two months they expect to have the plant in operation. The company are increasing their tonnage largely and are planning to erect two additional buildings, to be used as warehouses. They are selling a large amount of merchant steel and the machine shop is running full time on orders for projectiles.

The Woodstock Iron Works of Anniston, Ala., have been reorganized with Arthur Lehman of New York, president; John B. Knox of Anniston, Ala., vice-president; Norbert Heinsheimer, New York, secretary; P. J. Goodhart, New York, treasurer; A. H. Quinn of Anniston, Ala., assistant treasurer; J. W. Woolfolk, New York, general manager. The intention is to put No. 4 Furnace in blast by July 1, or earlier if possible.

The Longmead Iron Company, Conshohocken, Pa., manufacturers of wrought iron pipe and skelp iron, have recently purchased some additional property adjoining their plant, which will be used at present for railroad siding.

The main building of the new National Rolling Mill Company, Hartford City, Indiana, was blown down by a wind storm Thursday, May 23. The structure, which was under course of erection, was 64 x 285 feet, and while the material can be used for rebuilding, the reconstruction will entail a cost of several thousand dollars.

The West Leechburg Steel & Tin Plate Company, Leechburg, Pa., are installing a 12-inch hot mill and making some other improvements to their plant. The concern advise us that they are not going into the manufacture of black sheets.

The report that the Indiana Steel Company of Indianapolis, Ind., had purchased 1000 acres of coking and coal lands close to Masontown, Pa., with the intention of opening mines and building a coking plant, is untrue; no such purchase has been made.

The Auburn Furnace of the Susquehanna Iron & Steel Company, at Columbia, Pa., was blown in May 23.

The Pulaski Furnace, Virginia, which has been out for relining, is to be blown in the current week.

The Buffalo Union Furnace Company expect to blow in the Buffalo Furnace during June.

The Everett Furnace, at Everett, Pa., was blown out May 16 for repairs.

It is announced that the Chattanooga Furnace, Chattanooga, Tenn., will be blown in the current week.

The Bloom Furnace, at Bloom Switch, Ohio, was blown in May 13 last.

General Machinery.

The North Alabama Engineering Company, New Decatur, Ala., were incorporated in January under the State laws of Alabama. They purchased the building which was erected by the Ivens & Sons Machine Company during the boom in New Decatur in 1888 and which has been standing idle since 1889. They intend doing a general foundry and machine business and also contract for structural irons, or any line of castings. As specialties they will build stationary engines, of which they are now getting up a full line of patterns, also snuff mill machinery, and they expect within a little time to be equipped to manufacture sugar mill machinery for the Louisiana, Cuban and Philippine trade. Since purchasing the building the company have spent $10,000 in improvements and intend spending $30,000 more to bring up equipment to what they desire, one tool alone costing $12,000. The President of the company is Robert Dyas; secretary and general manager, H. K. Adams, and superintendent, Julien W. Adams.

The Vulcan Foundry & Machine Company of New Castle, Pa., have given their employees a nine-hour day with ten hours' pay. The new order went into effect last week.

The Canton Steam Pump & Mfg. Company, Canton, Ohio, have incorporated and are now getting things in shape for business. H. W. Vine is secretary and treasurer.

D. M. Osborne & Co., manufacturers of harvesting machinery and agricultural implements, will build an addition of several hundred feet to their foundry at Auburn, N. Y. The wall of the present foundry facing on Mechanic street is also to be rebuilt.

Whitcomb Brothers, machinists, at Barre, Vt., are building in the rear of their machine shop a storehouse 24 x 72 feet.

Draver Brothers, builders of Draver cyclone tubular dust collectors and Draver scroll mills, at Richmond, Ind., have incorporated under the same name and will continue the business along the same lines as heretofore.

A. Buck's Sons, manufacturers of farm machinery, cast and

steel troughs, special castings, &c., have outgrown their present plant at Elizabethtown, Pa., and are now erecting an entirely new one, which will consist of a wood working department, 50 x 200 feet, with a wing 30 x 26 feet; foundry, 54 x 96 feet, with a wing 37 x 32 feet; machine, erecting and painting department, 40 x 264 feet; warehouse and office, 150 x 50 feet, two stories; pattern house, 32 x 80 feet, and dry house. Two side tracks will be run into the works, one for loading and one for unloading materials. Machinery of latest design and other modern appliances are being installed. When completed the plant will be up to date in every respect and the firm will be in a better position than ever to take care of their increasing trade.

Application has been made by Lane Lyle and associates to the Secretary of State of Tennessee for a charter incorporating the Standard Machinery Company of Chattanooga, Tenn. The authorized paid up capital is to be $25,000. A building 50 x 150 feet, brick, two stories high, will be immediately erected and the plant equipped with new machinery throughout. Among the immediate purchases in the machinery line will be lathes, planers, radial drills, shapers, milling machines, horizontal boring machine, bolt cutter, traveling crane, blacksmith and pattern shop tools, &c. A gas engine will be used for motive power.

The contract for a large amount of electrical machinery for the city of Nashville, Tenn., to be used in the municipal lighting plant in that city, has been awarded to the Bullock Electric Mfg. Company of Cincinnati, Ohio. The order amounts to something over $50,000, and calls for two 500-kw. generators, together with a large amount of wiring, transformers, &c. It is claimed by the company securing the contract that it is one of the largest let for some time in the South.

The Taylor Machinery Company is the name of a new concern who have equipped a machine shop at Monroe and Clinton streets, Chicago. The firm will operate a general machine shop, and also manufacture iron and wood working machine tools under designs by Mr. Taylor.

Among the recent contracts awarded to the American Blower Company, Detroit, Mich., are the following: 24 fans, 80 to 140 inches, and a 360-inch forced draft fan, for the New York Glucose Company, Shady Side, N. J.; a 260-inch, full-housed fan, induced draft outfit for the United States Electric Light Company, Washington; two 280-inch, three-quarter housed, induced draft outfits for the Delaware, Lackawanna & Western Railroad Company, Scranton, Pa.

The De Laval Steam Turbine Company, 74 Cortlandt street, New York City, have incorporated with a capital of $1,000,000 to manufacture the De Laval steam turbine wheel for North and South America. The plant which the company are building at Trenton, N. J., will be the largest of its kind in the United States, when completed, and will consist of a main building 200 x 210 feet, and three or four smaller buildings, all of brick and of the saw-tooth type. It is expected that the works will be ready for operation about July 1. The officers are Daniel Lorrman, president; Richard R. Bowker, vice-president, and Francis J. Arend, secretary and treasurer.

Engines and Boilers.

The Fanning Mfg. Company, Pratt, Superior and Morgan streets, Chicago, will continue to manufacture hot air engines for power and pumping. An item recently published in these columns stating that the company had discontinued the manufacture of gasoline engines has been misconstrued by some of our readers as relating to hot air engines.

The J. C. McNeil Company, Akron, Ohio, advise us that all of their boiler makers, who were on strike, have returned to work, except ten. The firm did not make their shop union and never will. Nearly the entire plant of the above concern is now in full operation.

The Atwell Machinery Company, Hamilton Building, Pittsburgh, have purchased the entire stock of boilers, engines, pumps and machinery of the Moore Machinery Company of that city. They will use the shop and yards formerly occupied by the Moore Machinery Company, carrying practically the same line, but making a specialty of large engines.

The Lebanon Boiler Works, Philadelphia, have closed a contract with the American Iron & Steel Company, Lebanon, Pa., for a wrought iron water tank, 16 feet in diameter and 75 feet high, with a capacity of 125,000 gallons. The company have also a contract to erect a large ice plant at Atlantic City, N. J., one stack of which will be 60 inches in diameter and 100 feet high. Two 150 horse-power boilers and four large tanks also go to the latter city.

The White Locomotive Works, recently incorporated, propose to manufacture locomotives under special designs and patents. A new plant will be erected as soon as a location has been decided upon, which will probably be in Ohio. For the present their address is 75 Montgomery street, Jersey City, N. J., care of the Imperial Trustee & Audit Company. C. H. Wolterbeek is secretary.

The Marine Engine & Machine Company are enlarging their works at Harrison, N. J., by the erection of a foundry, 175 x 100 feet, with an ell 50 x 75 feet, which will be equipped with electric and pneumatic cranes and other modern devices for the manufacture of heavy iron castings. Like the machine shop, the foundry will be entered by a spur of the Pennsylvania Railroad, giving the best facilities for the handling of all products of the works. A hammer and forge shop, 100 x 60 feet, will shortly be built, adjoining the machine shop on the north, which will be equipped with steam hammers and all modern appliances. In the rear of the office building, the lower floor of which is used for storage purposes, another structure, 80 x 40 feet, is to be erected. Like the present buildings of the plant, all the new structures will be of brick and steel, with slate roofs. All the buildings are expected to be completed by September 1. In making these extensive improvements it is the intention of the company to considerably enlarge their capacity for building alcovapor launches, electric elevators, and for all kinds of heavy engineering. The working force will be increased from 175 to nearly 500 men when the enlarged plant is in full operation.

The International Power Company, Providence, R. I., operating Corliss steam engine works, have sold a large stationary steam engine plant to the Denver Tramway Company.

Machine Tools.

The Franklin Machine Works, Incorporated, Philadelphia, Pa., who have been engaged in the manufacture of printing and paper cutting machinery for the past 33 years, have recently engaged in the manufacture of machine tools, in addition to their former lines. The capital stock of the company has been increased from $50,000 to $75,000 paid in, and new and larger quarters, having over 10,000 feet floor space, have been secured in the Thorn Building, Thirteenth and Callowhill streets. A large amount of new machinery has been installed and other facilities added for economical handling and working of materials. Among the tools being manufactured by this company are horizontal floor boring, milling and drilling machines, cold saw cutting off machines and other special tools.

Foundries.

The Ohio Foundry Company have purchased the plant and business of the Union Foundry Company at Dayton, Ohio. The new company will continue the manufacture of light and heavy iron castings on a larger scale, and if business justifies it it is the intention of the new concern to considerably enlarge the present plant. J. A. Gauthier is president.

The Bessemer Foundry & Machine Company, Bessemer, Ala., who commenced operations on September 1, 1899, and made first castings January 15, 1900, have been kept busy all working days since then. For some months during that period they also worked a full night turn, and at present are running their machine shop department every night until 9.30. It is their intention to put on a night gang on June 1. They are now working on castings for the Semet-Solvay Company for their by-product coke ovens at Ensley, Ala., castings and machinery for rebuilding blast furnace at Trusville, Ala., castings for ten-foot vacuum pan for Payne & Joubert, New Orleans, La., and castings for rolling mills, furnaces and mines for firms in and around Bessemer.

The Simpson Iron Company, Columbus, Ohio, recently moved to new and larger shops. The company now have ample room for the manufacture of small castings, the foundry being large and well lighted. The chief business of this concern is to supply the various novelty manufacturers with small castings. The concern supplies the Hallwood Cash Register Company with all the castings they use. The force of men employed by the Simpson Iron Company is being steadily enlarged.

The Ross-Meehan Foundry Company, Chattanooga, Tenn., are kept busy with contracts for castings for cars and agricultural implements. They have lately put up a building for storing patterns and made addition to their machinery equipment. Their office building was damaged by fire on May 4. Repairs are expected to be complete by the middle of this month.

The Fort Wayne Foundry & Machine Company, Chicago, are about to remove their plant to Forty-third and Wood streets. Plans are being considered for two foundries, each 100 x 300 feet, an engine room and a blacksmith and machine shop. When completed, this will be one of the largest plants in Chicago.

Among recently licensed Illinois incorporations are the American Malleable Casting Company, Chicago, with a capital of $300,000, to manufacture iron and steel products. The incorporators are I. L. McCord, F. E. Lonas, and L. J. Highland. The company are erecting a large plant at Chicago Highlands, Ill., on the Wisconsin division of the Chicago & Northwestern Railway, about 18 miles from Chicago.

Gate City Foundry, Winona, Minn., has been started, after being closed down for some time to permit of additions and improvements. The plant has been enlarged by an addition, 16 x 40 feet, and the capacity has been greatly increased.

Hardware.

The Arcade Mfg. Company, Freeport, Ill., have purchased the toy business of the Coleman Hardware Company, Chicago, and are making preparations to supply this line of goods to the trade in addition to their own lines as heretofore.

The Chattanooga Implement & Mfg. Company of East Chattanooga, Tenn., have recently purchased the exclusive right to manufacture the line of Gardner pea hullers, formerly made by J. H. Gardner & Co., of Dalton, Ga., and have added them to their other lines.

The Kansas City Wire Bale Tie Company have just removed a portion of their plant from Kansas City to Wireton, Ill. The company manufacture special nails and bale ties.

J. M. and J. E. M. Rodgers of Sussex, England, have decided to locate their proposed edge tool works at Jonesboro, Ind.

The Hinsdale Screen Company, Hinsdale, Mich., have increased their capital stock from $15,000 to $30,000. The company will erect an engine room and power house, 30 x 30 feet, and a large two-story building 60 x 120 feet.

Nolen & Jones, Huntsville, Ala., who have conducted a jobbing and retail hardware business for 11 years, have sold out to M. A. Collins, formerly of Frankfort, Ky., and intend devoting themselves entirely to the development of the Huntsville Foundry & Machine Works, which they established about a year ago. They then bought the plant of the National Mfg. Company, and since that time have added a brick building 30 x 44 feet, two stories, and installed a number of new machines. They are now arranging to erect another two-story brick building 40 x 75 feet, the upper floor to be used as a paint shop and the lower for office and store room. They will continue the repairing department and manufacture hangers, pulleys, journal boxes, cane mills, emery grinders, wood saws, &c. They are also putting in a stock of steam fittings, belting, mill supplies, &c., which they intend to job. Since commencing business they have not shut down for an hour or discharged a man for lack of work, while the future promises them a steadily expanding trade.

Ohio Tool Company, Columbus, Ohio, are building a new warehouse and otherwise enlarging the facilities of their Auburn, N. Y., plant.

Crawfordsville Wire & Nail Company, Crawfordsville, Ind., are putting in a wire mill with a capacity of about 75 tons per day, and expect to have the mill in operation about September 1. The company intend to manufacture bale ties, woven wire fence, barb wire, wire nails and staples.

At a recent meeting of the stockholders of the Thomas Laughlin Company, Portland, Maine, it was voted to increase the capital stock by the issue of $50,000 of 5 per cent. preferred stock.

Miscellaneous.

The National Railway Spring Company are contemplating building an addition to their plant at Oswego, N. Y.

As noted in these columns last week, the Osborn Engineering Company, Osborn Building, Cleveland, Ohio, are preparing plans and specifications for the new plant of the Southern Car & Foundry Company, which new plant is to be located at Ensley, Ala. The main office of the Southern Car & Foundry Company is at Birmingham, Ala., and J. M. Elliott, Jr., is the president of the company. Part of the buildings will be of brick and steel and part of wood and corrugated iron. Electric transmission of power will be installed. There will be 500 horse-power of boilers, engines and electrical apparatus installed. Plans and specifications will be completed within a few weeks. J. M. Elliott will let contracts for buildings and equipments.

The Pittsburg Filter Mfg. Company, Empire Building, Pittsburgh, manufacturers of the Ideal system of water purification, are installing for the Citizens' Water Company, Washington, Pa., one of the largest water softening and filter plants ever erected in this country. The plant will consist of a treating and precipitating tank and four large gravity filters, having a capacity of between 3,000,000 and 4,000,000 gallons per 24 hours. It will be the largest water softening plant that has ever been built in this country. It is of the continuous gravity type, and is equipped with the company's latest system of treating and precipitating.

Among the larger contracts recently secured by the B. F. Sturtevant Company, Chicago, are the following: Complete heating apparatus for the new plant of the Sherwin-Williams Company, Newark, N. J.; all the heating and ventilating apparatus for the four large buildings of the new plant of the Stover Mfg. Company, Freeport, Ill.; heating and ventilating apparatus for the State Normal School at Cedar Falls, Iowa, and an induced draft outfit for the National Screw & Tack Company, Cleveland, Ohio.

The Phœnix Tube Company, 182 North Eleventh street, Brooklyn, N. Y., are now fully established in their new factory, at Driggs avenue and North Eleventh street. They have increased their capacity and improved their facilities for the manufacture of iron lined brass and bronze tubing, and will carry a large stock of all standard sizes to insure prompt delivery. They are also fully equipped to do polishing, lacquering and bending in all sizes from ⅜-inch to 2-inch.

The Ashland Sheet Mill Company.—The Ashland Sheet Mill Company, Ashland, Ky., is the title of a newly organized company that will operate an independent sheet mill at the place named. The company have been organized with the following officers: Ironton A. Kelly, president; T. J. McCullough, vice-president; L. R. Putnam, secretary, and Geo. McCullough, treasurer. The new concern are capitalized at $250,000, and will employ nearly 500 hands. It is reported that a shovel plant and a plow share factory will also be located at the same place.

Periodical Resawing of Rail Ends.

The *Railroad Gazette* presents the following translation of an article by M. Bauchal, assistant engineer maintenance of way, French Western Railroad, in the *Revue Générale des Chemins de Fer*, April, 1901:

The difficulty of establishing and keeping up good joints is one of the most serious in maintenance of way, but a recent experiment has led us to think that the periodical resawing of the ends of rails will settle this difficulty temporarily and in an indirect way while we wait for the coming of the satisfactory rail joint.

In 1898 the Western Railroad Company had at its disposal a large number of steel rails taken out of track before they were worn out and it was desired to use these again in a secondary line. The ends were much worn and deformed, and we were authorized to cut them all off 14 inches, drilling new holes for the splice bolts.

We first used revolving hand saws, but afterward used simple little hand saws, each one of which cost 5 francs. Each blade cost 0.9 franc and lasted on an average for two cuts. The total cost was 2.10 francs for cutting the two ends of one rail. To this must be added 1.2 francs for drilling four bolt holes.

Assuming rails 18 m. long and assuming that they were resawed at the end of 15 years, the cost per running meter of track would be very small. The cost for resawing not including administrative cost, would be $\frac{3.30 \times 2}{18} = 0.37$ francs per meter (say 6¾ cents per yard). No doubt this cost would be considerably reduced if the operation was carried out in a large way. Thus one could lay new rails on a dozen kilometers, resaw at some neighboring station the rails taken up, then lay these in the section adjoining that one from which they were taken up, and so on in succession, section by section. In working on this scale one would no doubt use a portable mechanical plant for sawing. Incidentally it is interesting to note that the use of these little hand saws is general on the Western Railroad system for cutting rails whenever occasion arises to do so.

The American Engineering Specialty Company, 1507-1510 Monadnock Building, Chicago, have been appointed by Warren Webster & Co., Camden, N. J., sole agents for the Webster system of steam heating, feed water heaters and purifiers, steam and oil separators and all specialties made by them covering the Central Western and Southwestern States. They are also exclusive agents for the American Steam Heating Specialty Company and for the American automatic system of heating and their specialties. They will continue the same branch offices as conducted by Warren Webster & Co., with additional ones to meet the increasing inquiry from architects, engineers and owners for the most efficient and economical method of heating and for high-class steam specialties.

The "Northman," the first steamer of the new Chicago-Hamburg service to cross the Atlantic Ocean, arrived at Hamburg on Tuesday, after a passage of 35 days from Chicago, of which 19 days were occupied traversing the great lakes and canals before leaving Quebec for the ocean voyage. The "Northman" was preceded by a sister ship, the "Northwestern," but the latter vessel's voyage was hindered by a mishap, thus giving the "Northman" the honor of being the first ship of the new service to make the Chicago to Hamburg trip.

A combination is being formed, with a capital of $15,000,000 or $20,000,000, for the purpose of controlling the redwood interests on the Pacific Coast.

The Iron and Metal Trades.

Interest centers in the negotiations now pending for the purchase of large blocks of Bessemer Pig Iron for the second half of the year by the United States Steel Corporation. It is probable that the result will be announced in a few days.

The general Foundry Iron trade is very quiet, and the market has really not been seriously tested, but it is conceded by some sellers that moderate concessions from present prices would be granted for orders with suitable delivery.

The machinists' strike, while it has not yet seriously cut down consumption, is, nevertheless, a factor. A good many of the leading manufacturers of machinery are taking the matter very seriously, as involving important questions of principle, and in many important producing centers a large proportion of the plants are practically idle. It may be continued longer than was thought likely earlier in the struggle.

Developments in Philadelphia lately are very significant. Interests closely allied with the United States Steel Corporation have secured control of the Cambria and Pennsylvania companies. While an actual merger is not, apparently, contemplated, it is pretty clear that these great interests will work in harmony. This is particularly interesting, so far as the future of the Rail trade is concerned, and will greatly influence the situation for 1902, which has been under discussion.

In some lines of Finished Iron and Steel deliveries are becoming prompter, notably in Plates and in Bars, and in some instances salesmen who had withdrawn some time since are beginning to visit the trade. In other branches, in Wire, Pipe, Sheets, &c., there is still difficulty in making deliveries.

Comparatively few large contracts have been given out for Structural Material. The largest probably is for 8000 tons of joint track elevation at Chicago. We may note also a bridge for the Baltimore & Ohio across the Ohio at Benwood, W. Va., involving about 1000 tons.

Nothing final has yet been heard from the Amalgamated Association of Iron & Steel Workers, who are arranging their scale at Milwaukee. There is little doubt that quite considerable advances may be demanded by the men, and there may be a brief shut down on July 1. The feeling in the trade is quite general that under prevailing circumstances no prolonged idleness will be permitted to occur.

The export trade is light. Foreigners have taken some business in Canada in Steel at about 87 shillings 6 pence c.i.f. Montreal and Steel Rails have also been offered at a fairly low figure.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	June 5, 1901.	May 29, 1901.	May 8, 1901.	June 6 1900.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	*$15.00*	$15.00	$15.25	$19.50
Foundry Pig, No. 2, Southern, Cincinnati	*13.50*	13.75	14.00	19.75
Foundry Pig, No. 2, Local, Chicago	*15.00*	15.50	15.50	21.00
Bessemer Pig, Pittsburgh	*16.00*	16.00	16.25	20.00
Gray Forge, Pittsburgh	*14.25*	14.25	14.75	18.00
Lake Superior Charcoal, Chicago	*17.00*	17.00	18.00	23.50
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh (nom)	24.00	24.00	24.00	28.00
Steel Billets, Philadelphia (nom)	26.25	26.25	26.25	nom.
Steel Billets, Chicago, (nom)	.....	.....	28.00	nom.
Wire Rods (delivered)	39.00	39.00	39.00	nom.
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	35.00
Spikes, Tidewater	1.80	1.80	1.80	2.25
Splice Bars, Tidewater	1.40	1.40	1.40	2.20
OLD MATERIAL:				
O. Steel Rails, Chicago, gross ton	*13.00*	13.00	13.50	13.50
O. Steel Rails, Philadelphia	*16.00*	16.00	16.75	17.00
O. Iron Rails, Chicago, gross ton	*18.50*	18.50	19.00	16.00
O. Iron Rails, Philadelphia	19.50	19.50	19.50	17.00
O. Car Wheels, Chicago, gross ton	16.50	16.50	16.50	23.00
O. Car Wheels, Philadelphia	17.50	17.50	17.50	18.00
Heavy Steel Scrap, Chicago, g. ton	*13.00*	13.00	13.50	12.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	**1.55**	1.55	1.50	1.60
Common Iron Bars, Chicago	1.55	1.55	1.55	1.90
Common Iron Bars, Youngstown	1.45	1.45	1.45	....
Steel Bars, Tidewater	1.62½	1.62½	1.62½	2.10
Steel Bars, Pittsburgh	1.40	1.40	1.40	1.70
Tank Plates, Tidewater	*1.75*	1.80	1.80	1.65
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.45
Beams, Tidewater	1.75	1.75	1.75	2.40
Beams, Pittsburgh	1.60	1.60	1.60	2.25
Angles, Tidewater	1.75	1.75	1.75	2.40
Angles, Pittsburgh	1.60	1.60	1.60	2.25
Skelp, Grooved Iron, Pittsburgh	**1.80**	1.75	1.75	1.55
Skelp, Sheared Iron, Pittsburgh	1.85	1.80	1.85	1.65
Sheets, No. 27, Pittsburgh	3.20	3.20	3.20	3.10
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	2.80
Wire Nails, f.o.b. Pittsburgh	2.30	2.30	2.30	2.20
Cut Nails, Mill	2.00	2.00	2.00	2.05
METALS:				
Copper, New York	17.00	17.00	17.00	16.37½
Spelter, St. Louis	*3.77½*	3.77½	3.85	4.27½
Lead, New York	4.37½	4.37½	4.37½	3.87½
Lead, St. Louis	**4.30**	4.25	4.20	3.82½
Tin, New York	**27.85**	28.35	26.30	29.75
Antimony, Hallett, New York	8.75	8.75	8.75	8.62½
Nickel, New York	**60.00**	60.00	55.00	55.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.84

Chicago.

1205 FISHER BUILDING, June 3, 1901.

Labor troubles in the machinery trade and the closing of so many machinery manufacturing establishments have thus far had no serious effect on the local Iron trade. Deliveries of Pig Iron have in some cases been ordered to be held back, but in no other respect has any branch of the Iron trade been disturbed. The strike of the machinists is not making the impression here which its importance seems to deserve. This is probably due to the fact that quite a number of the Chicago machinery establishments are running on new agreements with their men in the nature of a compromise. The machine shops of the largest establishments in this line are deserted and unless the strike is soon settled such works will be completely idle. General business has been satisfactory, with the exception of Foundry Pig Iron. The Wire trade continues as active as previously reported. Manufacturers of finished products are well supplied with work and the outlook is regarded with confidence. It is expected that the rolling mills will be closed in July for repairs and probably for the adjustment of the yearly scale of wages, and this naturally causes some rush orders for Bars and other Finished Iron and Steel.

Pig Iron.—Transactions have been confined to small quantities. Inquiries are light, and from present appearances the month of June will be a quiet period. Com-

mission merchants do not look for much business until after July 1, when some large consuming interests who have not yet covered their requirements for the last half of the year are expected to be in the market. The effect of the machinists' strike is noticed in some requests to hold back shipments on contracts. This is offset by orders received from implement makers and other large consumers anticipating deliveries. The implement manufacturers are enjoying a very heavy demand for their products and are compelled to increase their output and are thus using more material than had been expected. Prices, especially on Southern Irons, are still weak and it is possible that our quotations can be shaded 25c. It is claimed, however, that the leading Southern companies are not meeting the extreme prices now being made, believing that general business conditions are too good to warrant such a decline. A slight increase in the demand for Pig Iron would put a decidedly different face on the situation. We quote as follows:

Lake Superior Charcoal	$17.00 to $18.00
Local Coke Foundry, No. 1	15.50 to 16.00
Local Coke Foundry, No. 2	15.00 to 15.50
Local Coke Foundry, No. 3	14.50 to 15.00
Local Scotch, No. 1	15.75 to 16.25
Ohio Strong Softeners, No. 1	16.50 to 16.75
Southern Silvery, according to Silicon	15.15 to 15.40
Southern Coke, No. 1	14.90 to 15.15
Southern Coke, No. 2	14.40 to 14.65
Southern Coke, No. 3	13.90 to 14.15
Southern Coke, No. 1 Soft	14.90 to 15.15
Southern Coke, No. 2 Soft	14.40 to 14.65
Foundry Forge	13.40 to 13.65
Gray Forge and Mottled	13.40 to 13.65
Southern Charcoal Softeners, according to Silicon	15.00 to 16.50
Tennessee Silicon Pig	16.00 to 17.00
Alabama and Georgia Car Wheel	20.15 to 20.65
Malleable Bessemer	16.25 to 16.50
Standard Bessemer	17.50 to 18.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon	15.75 to 16.75

Bars.—The demand for Bar Iron, while not up to the standard of the past month, is nevertheless considerably better than might have been expected under the circumstances. Quite a considerable tonnage has been placed during the week, all classes of buyers being represented. The merchant trade have particularly been placing good orders in anticipation of the shutting down of mills in July. Not much hope is entertained that the continuous scale plan will be adopted by the Amalgamated Association, and therefore the usual closing of mills pending the settlement of the yearly wages schedule is expected. The demand for Steel Bars has been fair, but for the first time in three or four months salesmen have been sent out to interview the trade and secure such orders as may now be available. The Steel works are in possession of numerous contracts for future delivery, but it is thought well to keep in touch with the trade. Mill shipments are quoted at 1.55c. to 1.60c., Chicago, for Common Iron, with occasional orders being entered by some of the mills as low as 1.50c. Soft Steel Bars are now held at 1.55c. to 1.60c., and Hoops at 2c. Jobbers report a very good demand from stock. Small lots are quoted at 1.90c. to 2c. for either Iron or Steel Bars, and 2.20c. to 2.25c., base, for Hoops.

Structural Material.—No large contracts have been placed as far as can be learned. The demand for small lots, however, is steady, making a good aggregate tonnage for the week. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.75c. to 1.85c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—While some of the mills are finding specifications not coming in as rapidly as desired, the local mill is having a different experience. Consumers who have contracts with this mill are taking shipments fully up to their agreements, while new orders are being received. The new business is not heavy, but sufficient to keep the works running to full capacity. The demand from stocks of local jobbers continues very good. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.80c., Chicago; Flange, 1.85c.; Marine, 1.95c. Jobbers are selling small lots from store at 1.90c. to 2c. for Tank and 2.25c. for Flange, with the usual extras for heads, segments, lighter gauges, &c.

Sheets.—The pressure on the Sheet mills for more rapid delivery continues strong. This branch of business is in excellent shape and prospects are very encouraging for the immediate future. Jobbers report a sustained demand for quick shipments from stock. Small lots of N. 27 Black Sheets are quoted at 3.40c. to 3.50c., and Galvanized, 70 per cent. off.

Merchant Pipe.—Conditions are fully as satisfactory as in previous weeks. The demand keeps all sizes moving briskly and prices are firm. Manufacturers' prices, random lengths, are as follows:

	In carloads.		Less than carloads.	
	Blk.	Galvd.	Blk.	Galvd.
⅛ to ½ inch and 11 to 12 inches	59.2	46.2	54.9	40.9
¾ to 10 inches	66.7	53.3	61.9	49.9

Boiler Tubes.—No change is observed in this branch. Quotations on less than carload lots from jobbers' stocks are as follows:

	Steel.	Iron.
1 to 2½ inches	50	40
2¾ to 5 inches	57½	47½
6 inches and larger	50 and 5	47½

Rails and Track Supplies.—If manufacturers were able to make deliveries they could easily book 75,000 tons of Heavy Section Rails for this year's shipment. It is impossible at present to place orders with any of the mills for earlier than the last two months of the year. Some business is doing in Light Sections, but the mills are also well booked for this class of product and cannot make early shipments. Prices are firm at $28 to $33, according to section. Track Fastenings are in good demand with prices unchanged. Quotations are as follows: Splice Bars, 1.75c. to 1.80c.; Spikes, 1.95c. to 2c.; Track Bolts, with Hexagon Nuts, 2.80c.; with Square Nuts, 2.65c.

Merchant Steel.—The mills making a specialty of Merchant Steel are well satisfied to have some of their customers defer placing contracts, as it will give them an opportunity to catch up on orders booked on which they are now having urgent requests to make more prompt shipment. A good demand is noted for small lots, while occasionally a good sized order is placed for future delivery. Mill shipments, Chicago, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. for carloads and 7c. from store; Specials, 13c. upward.

Old Material.—A few classes of Old Material are in good demand, such as Old Steel Rails, Iron Splice Bars and Busheling Scrap. Otherwise the market is dull, the supply is abundant and prices must be shaded in order to effect a sale. The following are approximate quotations per gross ton:

Old Iron Rails	$18.50 to $19.50
Old Steel Rails, mixed lengths	13.00 to 13.50
Old Steel Rails, long lengths	15.00 to 15.50
Heavy Relaying Rails	21.00 to 22.00
Old Car Wheels	16.50 to 17.00
Heavy Melting Steel Scrap	13.00 to 13.50
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	19.00 to 19.50
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	14.00 to 14.50
No. 2 Railroad Wrought	12.00 to 12.50
Shafting	15.50 to 16.00
No. 1 Dealers' Forge	12.00 to 12.50
No. 1 Busheling and Wrought Pipe	10.50 to 11.00
Iron Axle Turnings	9.50 to 10.00
Soft Steel Axle Turnings	9.00 to 9.50
Machine Shop Turnings	8.50 to 9.00
Cast Borings	4.00 to 4.25
Mixed Borings, &c	4.50 to 5.00
No. 1 Boilers, cut	11.50 to 12.00
No. 2 Boilers, cut	9.50 to 10.00
Heavy Cast Scrap	11.00 to 11.50
Stove Plate and Light Cast Scrap	8.50 to 9.00
Railroad Malleable	11.50 to 12.00
Agricultural Malleable	10.50 to 11.00

Metals.—Pig Lead is still held at 4.32½c. for Desilverized and 4.42½c. for Corroding in 50-ton lots. Copper is unchanged at 17½c. for carload lots of Lake, and 17¼c. for Casting brands.

Coke.—The dullness in Foundry Pig Iron is reflected in the quiet condition of the Coke trade. Quotations are $4.50 to $5 for 72-hour Foundry Coke.

Gardner & Robinson, 1522 Monadnock Building, Chicago, have made arrangements by which they are in a

position to furnish all kinds of Heavy Steel Plate work, including Tanks, Draft Stacks and Blast Furnace work, and are also prepared to supply Ore, Cinder and Hot Metal Buggies, &c. This work will be manufactured for them by the Enterprise Boiler Company of Youngstown, Ohio, whom they represent in Chicago territory.

Philadelphia.

FORREST BUILDING, June 4, 1901.

We have again to report a dull and sluggish market at unchanged prices. In one sense of the word there is no reason why this should be so, yet from another standpoint the market could hardly be other than what it is. The strong feature is that consumption is maintained at its maximum and deliveries are taken in a most encouraging manner. On the other hand, the unsettled condition of labor and a partial cessation of work in many large establishments is inimical, especially as it is not yet clear how the matter will end. For the reason first named prices are held with a fair degree of firmness, and for the second there is a decided indisposition to place orders until there is some prospect of an amicable arrangement. The natural result is that business is practically the same as it has been for several weeks past—dull and without special feature, and at this time it is impossible to form any definite opinion how soon the deadlock will end or in what way it will end. The chances are, however, that we may run along in the present groove until pretty well on toward midsummer, as there is not much probability of heavy buying until then, and even then the question of prices is more or less uncertain. The various pools control the prices of Finished Material, and in these there is not likely to be any decline, as there is no inducement for outside cutting. On the whole, therefore, the situation is not unfavorable, but it would be more satisfactory if the labor question was settled, and in a manner which would prevent further interference from this source.

Pig Iron.—Business has been confined mostly to small lots to meet early requirements. Buying for long delivery is still in abeyance, and neither buyers nor sellers appear to be disposed to take the initiative in forcing matters. There is an idea that in consequence of the strike in various parts of the country the consumption of Pig Iron will be somewhat decreased, and, as a matter of course, leave a larger surplus at furnaces than would be the case under ordinary circumstances. For the present, however, deliveries are well taken, and it is only here and there that postponements are requested. Under these circumstances makers of Pig Iron regard themselves as being in a safe condition, and unless there is a demand at something very close to current quotations they are willing to bide their time. There is some inquiry for large lots, but as yet buyers have not felt confident enough to make firm offers at prices which would be acceptable to the seller. There is a fair probability that considerable quantities of low grade and Mill Irons will be required in the near future, but as yet there is nothing definite to report in the way of sales. There is no variation whatever from the quotations of last week, which were as follows for seaboard or nearby deliveries: No. 1 X Foundry, $16 to $16.25; No. 2 X Foundry, $15.25 to $15.50; No. 2 Plain, $14.75 to $15; Standard Gray Forge, $14.25 to $14.50; Ordinary Gray Forge, $13.75 to $14; Basic (Chilled), $14.25 to $14.50.

Billets.—There is quite a good demand for Billets, but it is extremely difficult to get quotations for early shipments. Nominally about $26.20 is the price, but to secure early deliveries more money is asked, and the figure would probably be nearer $27 than the rate first named.

Plates.—There is quite a falling off in the demand for Plates, due in a measure to the machinists' strike and the curtailment of work in many large establishments. New business comes in slowly, and is confined mostly to small and medium sized lots, large orders being in abeyance temporarily. Prices are steady, however, and are quoted as follows for seaboard and nearby points: Plates, ¼ inch and thicker, 1.75c. to 1.80c.; Universals, 1.75c. to 1.80c.; Flange, 1.90c. to 2.10c.

Structural Material.—There is plenty of work at the mills, and in many cases it is still difficult to secure prompt deliveries, but there is not much new business being placed at the present time. Prices remain as last quoted for seaboard or nearby deliveries: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—There is very little change in this department. There is a good inflow of orders and most of the mills find their capacity fully occupied. Owing to the pooling arrangements prices are evenly maintained, as there is nothing to be gained by going below the pool prices. Quotations for seaboard and nearby deliveries are as follows: Iron Bars, 1.55c. to 1.65c.; Steel Bars, 1.62½c. to 1.70c., delivered.

Sheets.—There is no cessation in the demand for Thin Sheets, and deliveries are hard to get with anything like reasonable promptitude. Prices are difficult to quote, but the figures of last week are probably as near to the market as can be given for best Sheets (common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c.; No. 28, 3.75c. to 3.80c.

Old Material.—There is no improvement in the demand, but prices yield very slowly and it is difficult to get more than slight concessions. Steel Rails have been sold at $16, Machinery Scrap at $14, Choice No. 1 Wrought at $19, Turnings at $12 and Borings at $8.50. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, $19 to $20; Country Scrap, $16 to $17; No. 2 Light Scrap, $12.50 to $13.25; Machinery Cast, $13.50 to $14; Heavy Steel Scrap, $16 to $16.50; Old Iron Rails, $19.50 to $20; Old Steel Rails, $16 to $16.25; Wrought Turnings, $11.75 to $12.25; Cast Borings, $8.50 to $9; Old Car Wheels, $17.50 to $18; Iron Axles, $21.50 to $22.50; Steel Axles, $17 to $18.

Pittsburgh.

HAMILTON BUILDING, June 4, 1901.

The situation in the Iron trade continues quiet, but owing to the heavy tonnage on the books of the mills there has as yet been no weakness in prices, with the exception of Pig Iron. On the contrary, we may state that on several lines of Finished Material, rolled from Iron, prices are firm, owing to the fact that there may be trouble in fixing up the Amalgamated wage scales this year. There is no doubt but that the scales, which have been prepared at the Amalgamated Association meeting in Milwaukee in the past two weeks, will contain material advances, and whether these will be granted by the mills who sign the scale remains to be seen. It is likely the puddling scale will be based on not less than $6 a ton minimum for boiling, and it may be higher. The Sheet and Tin Plate wage scales are also certain to be higher, so that the situation after July 1, as regards labor, is uncertain. On this acccount Muck Bar, Iron Skelp and other articles rolled from Iron are very firm, and in some cases higher prices are being quoted. The whole situation is strong, aside from Pig Iron, and there does not seem to be any reason why prices ought to decline. With orders on the books of the Rail mills for over 2,500,000 tons of Rails, Billets are scarce, and the finishing mills with enough tonnage to carry them up to July 1 or longer, it is not likely any weakness in prices will develop before that date, if then. The sessions of the Amalgamated Association in Milwaukee will conclude this week, and it is likely that something definite will be known in a few days as to the new scales. In the local Iron trade there is nothing of special interest to note. The mills are all busy, and some lines of Finished Iron and Steel are about as hard to get for prompt delivery as they have been at any time.

Pig Iron.—The Pig Iron situation continues very quiet and prices are weak, especially for Bessemer and Gray Forge. Negotiations are on this week for the purchase of a round lot of Standard Bessemer Iron by

the United States Steel Corporation. It is reported that 200,000 tons may be placed with the Bessemer Furnace Association before this week is out. We quote: Standard Bessemer Iron, $15.25 to $15.50, Valley furnace, or $16 to $16.25, f.o.b. Pittsburgh; Gray Forge, $13.50 to $13.75, Valley, or $14.25 to $14.50, Pittsburgh. No. 1 Foundry Iron is $15.25 to $15.50; No. 2, $14.75 to $15; No. 3, $14.25 to $14.50, all f.o.b. Pittsburgh.

Steel.—Billets continue very scarce, and for prompt delivery Bessemer, 4 x 4 inch, bring $24.50 to $25, Pittsburgh. Basic Open Hearth Billets are quoted at $25 to $28, depending on carbons and deliveries wanted by the buyer.

Ferromanganese.—The market is very dull, and we continue to quote domestic 80 per cent. Ferro at $58.50, in gross tons, delivered at buyer's works.

Muck Bar.—We may note that the market on Muck Bar is higher, owing to the fact that the Amalgamated scale taking effect July 1 will be based on $6 per ton for puddling, or higher. This may result in a shut down of the mills rolling Muck Bar, creating a scarcity. We quote Standard grades at $28.25 to $28.50, delivered, Pittsburgh. A sale of about 200 tons is reported at the first named price.

Steel Rails.—The Rail tonnage this year is away beyond expectations of the mills, and with over 2,600,000 tons sold in the year beginning October 1, 1900, explains why some of the Rail mills are practically out of the market as sellers for this year and have been compelled to turn down some tonnage. We quote Standard Sections at $28, at mill. It is claimed that for small lots of Rails an advance has been obtained, where the mill could make prompt delivery.

Structural Material.—Several large new buildings and a good deal of railroad work have been taken by the American Bridge Company. A large office and bank building is being figured on for the corner of Fifth avenue and Wood street, Pittsburgh, the prospective builder being the Farmers' Deposit National Bank in this city. The report that Messrs. Frick, Mellen and Oliver would build an auditorium in Pittsburgh is denied. The Structural mills are all filled up for the next two or three months. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.40c. to 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

Plates.—Business is light, but the Plate mills are pretty well filled up on old contracts. However, we may note that there is no difficulty now in getting prompt deliveries. A fair amount of Fire Box and other higher grades of Steel is being placed. Prices are firm and we quote: Tank quality, ¼-inch and heavier, 1.60c.; 3-16 inch, 1.65c.; under 3-16 inch and above No. 10, 1.70c.; Flange or Boiler Steel, 0.1c. advance over the base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

Bars.—A fair amount of tonnage is being placed in Iron and Steel Bars, but not nearly so heavy as some time ago. However, the mills are so well filled up on old contracts that prices are firm, and in view of the uncertainty of the labor situation in the Bar mills after July 1 there is no reason why prices ought to get any weaker, but, on the contrary, they will likely remain very firm. We quote Steel Bars at 1.40c., at mill, half extras. On Open Hearth Steel Bars $2 a ton advance is charged and also extras on high carbons. All prices on Steel Bars are f.o.b. Pittsburgh, with freight added. We quote Common Iron Bars at 1.45c. to 1.50c., half extras, at Valley mill. We quote Hoops at 1.90c., base, for large lots and 2c. in small lots. Bands up to 12 gauge are sold on the Steel Bar card, and we quote at 1.40c. to 1.45c., depending on the order.

Sheets.—The situation in Sheets, as regards new tonnage, is quieter than it has been for some time. Prices, however, are firm, owing to the fact that the mills are so well filled up on old contracts. The new Sheet mill scale will likely be a little higher than the one which expires on June 30. We quote: No. 27 Black Sheets, box annealed, at 3.20c. to 3.25c.; No. 28, 3.30c. to 3.35c. The demand for Galvanized Sheets is larger than for Black and prices are firm. We quote 70 and 5 per cent. off in carload lots, and 70 and 10 in large lots, f.o.b. maker's mill.

Merchant Steel.—There is nothing of special interest to note this week. A fair amount of new tonnage is coming in, but very much lighter than some time ago. We quote: Tire Steel, 1.60c.; Toe Calk, 1.85c.; Open Hearth Spring, 2c.; Plow Slabs, 2c.; Tool Steel, 7c and upward, depending on quality. On Tool Steel freight is allowed.

Tubular Goods.—We note a continued active demand for Tubular goods of all kinds, and the Pipe mills are all well filled up for some time. Prices are very firm, and to the small trade in less than carload lots are as follows:

Merchant Pipe.

	Per cent. Black.	Per cent. Galvd.
⅛ to ½ inch and 11 to 12 inch	61	48
¾ to 10 inch	68½	56

Casing, Random Lengths.

	S. & S.	I. J.
2 to 3 inch	58	53½
3¼ to 4 inch	63	59
4¼ to 12½ inch	65	61½

Casing, Cut Lengths.

	S. & S.	I. J.
2 to 3 inch	53½	59
3¼ to 4 inch	59	55
4¼ to 12½ inch	61½	57½

Boiler Tubes. Up to 22 feet.

	Per cent.
Steel.	
1 inch to 1¾ inch and 2¾ inch to 5 inch, inclusive	65½
2 inch to 2½ inch, inclusive	60
6 inch and larger	59
Iron.	
1 inch to 1½ inch and 2½ inch	43½
1¾ inch to 2¼ inch	43
2¾ inch to 13 inch	53

Prices made by the mills to the jobbers are from 5 to 10 per cent. lower than the above.

Skelp.—Prices of Grooved and Sheared Iron Skelp are higher, due to the possibility that the mills rolling Iron Skelp may close July 1 on account of labor troubles. We quote Grooved Iron Skelp at 1.80c. to 1.85c. and Sheared at 1.85c. to 2c., the higher price being for very narrow or very wide sizes. Grooved Steel Skelp is about 1.75c. and Sheared 1.80c. to 1.85c., maker's mill.

Coke.—The output of Coke in the Connellsville region last week was 230,755 tons, and shipments were 10,126 cars. The price of strictly Connellsville Furnace Coke is $2 a ton for second half of the year delivery. Seventy-two hour Foundry is $2.50 a ton. Main Line Furnace Coke is $1.75 to $1.85, but for June shipment the lower price could be shaded. Foundry is from $2 to $2.25.

Cleveland.

CLEVELAND, Ohio, June 4, 1901.

Iron Ore.—The shipment of Ore from Duluth to June 1 was 788,549 tons, while that of last season was 1,790,999 tons. This in part indicates the seriousness of the delay caused by the ice blockade and the strike of the marine engineers. Another result is seen in the recent action of the United States Steel Corporation. That concern have now chartered tonnage aggregating almost 5,000,000 tons, and have announced that they will need no more boats on long time contracts. The company will be in the market from time to time for wild boats. Charters were made for season movements this week for upward of 500,000 tons carrying capacity to move the surplus Ore of this one concern. It has been announced that the delays have cut the carrying capacity of the big fleet down 1,000,000 tons during the season, or about one-tenth. This shortening of the season has not been without its effect upon the freight market. The United States Steel Corporation have abandoned their efforts to break the contract rate of 80c., and placed all of their tonnage on that basis with the possible exception of those boats which have been chartered

for the short season terminating October 15. Shippers have been forced to curtail wild movements of late, owing to a serious congestion at the lower lake docks, where boats have been finding it difficult to get rid of their cargoes. Wild chartering, therefore, is not very active, but the rates are holding firm, 80c. being paid upon all cargoes placed from the head of the lakes, with 70c. paid out of Marquette and 60c. out of Escanaba.

Pig Iron.—A downward tendency is still apparent in the Pig Iron trade, evidenced this week by a decline in the price of Bessemer. The association has virtually named $15.50, Valley furnace, as the price at which it is willing to do business, and a few sales have been made on that basis both for immediate delivery and for shipment after July 1. Some of the producers have not stood with the association, and a small amount of Iron has gone in at $15, Valley furnace. Even at the lower figures the trading is not heavy, as the interest in the business beyond July 1 is not as intense as some of the producers might wish. Basic is holding its own at $15, but is doing but little more. There is but little interest in Foundry Irons, as the immediate delivery sales are light, and nothing is being done in the second half of the year. Some of the producers are a little apprehensive, for the future of the Pig Iron trade based probably on the understanding that not so much of it is to be melted after July 1 as is now being consumed. The quotations for immediate delivery and also for future delivery are Foundry No. 1, $14.50, and Foundry No. 2, $14, Valley furnace.

Finished Material.—The Plate mills this week have sent out circular letters announcing to the trade that they are in position to make prompt deliveries on orders, which are solicited. Many of the mills, anticipating a continuance of the heavy ordering which characterized the fore part of the year, have produced all of the Steel possible, and now find that the energy of the plants is more than equal to the possible demand later in the season. Some bridge orders are coming in, however, and the mills have good prospects for car orders soon, and with several ship orders placed recently the outlook is not so discouraging after all. There is no intimation of a change of price, 1.70c. being quoted by all producers to Cleveland buyers. The orders coming in on Structural Material are good and heavy, more so, in fact, than any other grade. Besides the mills are well filled for the next few months, and deliveries are possible only after a delay of 30 days. The Structural Steel trade is in better shape than any other grade of finished material. The prices hold firm at 1.70c. All of the big requirements for Bars have been covered by contract, and all that remains to be done now is to fill in odds and ends with sales of carload lots.

Old Iron.—The Scrap Iron trade is rather dull. There is no demand for the material in any quarter, and the supply is not brisk at that. The general tendency in prices is downward, although many of the dealers are refusing to dispose of their material at less than the prices for which they have held. In the absence of any business it is almost impossible to quote prices which would represent the market.

St. Louis.

CHEMICAL BUILDING, June 5, 1901.—(*By Telegraph.*)

Pig Iron.—Continued dullness is the prevailing feature in Pig Iron and prices are gradually working to a lower level. There have been a number of sales made, but the quantities in each instance have been small and for immediate delivery, which would seem to indicate a disposition on the part of consumers to buy only as their immediate needs require. The impression is gaining ground that stocks on furnace banks are accumulating and the statistical report covering the stocks on hand, which will be issued this week, is awaited with considerable interest. We quote carload lots as follows, f.o.b. St. Louis:

Southern, No. 1 Foundry	$14.50 to $14.75
Southern, No. 2 Foundry	14.00 to 14.25
Southern, No. 3 Foundry	13.50 to 13.75
Southern, No. 4 Foundry	13.00 to 13.25
No. 1 Soft	14.75 to 15.00
No. 2 Soft	14.25 to 14.50
Gray Forge	12.75 to 13.00

Bar Iron.—A fair run of orders have been booked and inquiries are at hand which, if sales are made, will make a good round tonnage. Jobbers report a heavy country trade and are in the market almost daily for the purpose of keeping their stocks in shape. Mills quote Iron and Steel Bars at 1.60c. to 1.65c., half extras, East St. Louis. Jobbers quote Iron Bars, 1.85c. to 1.90c.; Steel, 1.95c. to 2c., full extras.

Rails and Track Supplies.—There are no sales of Heavy Sections reported, but a steady demand is noted for light sections from the South and Southwest. Mills are experiencing considerable difficulty in making prompt shipment, and more business could be secured if the material could be forwarded more promptly. We quote: Splice Bars, 1.80c. to 1.85c.; Bolts, with Square Nuts, 2.45c. to 2.55c.; with Hexagon Nuts, 2.60c. to 2.65c.; Spikes, 1.90c. to 1.95c.

Pig Lead.—A strong demand has been developed for Pig Lead and prices are firmer in consequence. Choice brands command 4.30c. to 4.32½c. and outside brands are readily taken at 4.27½c. A higher market is generally anticipated.

Spelter.—There is nothing of interest to note on the Spelter market. Sellers ask 3.80c. to 3.82½c., and a few carload lots have changed hands at these figures. No immediate change in prices is looked for.

Cincinnati.

FIFTH AND MAIN STS., June 5, 1901.—(*By Telegraph.*)

In the local Pig Iron market the condition has changed in nowise during the last week. The situation appears to be exceedingly dull, and the traveling men from the different agencies are drifting back home again, having found the business obtainable hardly worth the expense of going after. Of course there is a little something doing, but not enough to come anywhere near to satisfying the appetite of any one concerned. The outlook for business is an exceedingly slim one. The strike is having a deterrent influence on buyers, and a feeling of uneasiness pervades over everything. In regard to prices, they are nominally unchanged, and weak on the basis of figures quoted in last market report. While No. 2 Southern Foundry is nominally held at $11, and no quotations are given out for any lower figures, yet it is believed that active inquiry would bring out prices probably 50c. lower. Freight rate from Birmingham is $2.75 to this point; from Hanging Rock district, $1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$14.25 to $14.75
Southern Coke, No. 2	13.75 to 14.25
Southern Coke, No. 3	13.00 to 13.75
Southern Coke, No. 4	12.25 to 13.00
Southern Coke, No. 1 Soft	14.25 to 14.75
Southern Coke, No. 2 Soft	13.75 to 14.25
Southern Coke, Gray Forge	12.25 to 12.50
Southern Coke, Mottled	12.25 to 12.50
Ohio Silvery, No. 1	15.50 to 16.00
Ohio Silvery, No. 2	14.50 to 15.00
Lake Superior Coke, No. 1	15.25 to 15.75
Lake Superior Coke, No. 2	14.75 to 15.25
Lake Superior Coke, No. 3	14.25 to 14.75
Southern Basic	14.00 to 14.75
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel, chilling grades	$18.25 to $18.75
Standard Southern Car Wheel, No. 2	17.25 to 17.75
Lake Superior Car Wheel and Malleable	18.50 to 19.00

Plates and Bars.—The market is quiet and the situation practically unchanged, with a moderately fair amount of current trade. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.60c., with half extras; same in small lots, 1.80c., with full extras; Steel Bars, in carload lots, 1.55c., with half extras; Base Angles, in carload lots, 1.80c.; Plates, ¼-inch and heavier, 1.80c.; Sheets, No. 16, 2.50c.

Old Material.—The market is quiet and business only fairly active. We quote dealers' buying prices, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, per net ton, $16; Cast Railroad Machine Scrap, $12.25 to $12.75; Iron Axles, $18.75 to $19; Iron Rails, $16.75 to $17.25; Steel Rails, rolling mill lengths, $14.75 to $15.25; short lengths, $13.75 to $14; Car Wheels, $15.75 to $16.25. All prices except No. 1 Wrought on the basis of gross tons.

Birmingham.

BIRMINGHAM, ALA., June 3, 1901.

The market the past week was characterized by the same dullness that prevailed the preceding week. But there was no disposition manifested to concede in prices. There were some rather large inquiries both for Foundry and Forge grades, and Basic Iron was also in request. But the business concluded was mainly of a retail character. There were sales of No. 2 Foundry at $11.50, $11.25, $11, and one or two sales at $10.75. The bulk of the sales were at $11 and $11.25. The total aggregate was light. Gray Forge is quoted at $10 and $10.25. It sold at $10 and $9.75. No. 3 Foundry is quoted at $10.50 to $10.75. The market is characterized as a buyers' market. While there is more or less nibbling at prices, sellers anticipate that active buying will begin in this month to fill requirements not provided for. The Cast Iron Pipe companies are just beginning to feel the market, and sooner or later must be important buyers. It is a significant fact that in some instances where purchases do not mature for months to come requests have been made to anticipate delivery on account of low condition of consumers' stocks. The impression is current that the stock report for May will show a decrease and invite a more active interest in the market. Shipments continue to be active and they are taxing facilities for prompt movement. The movement in Steel continues good and the proiuct of the mill goes out as fast as it is produced. There continue to be reports of improvements, enlargements and betterments to be made, notably in the Tennessee Coal, Iron & Railroad, and there is little doubt but that plans to that end are being matured. A meeting of the stockholders is called for June 11 in New York, and at that meeting the desired authority to proceed will be given and the ways and means provided to pay for same. The huge engine of the Steel Rail mills has been placed in position and it will be tested this week. Some time in July it will be ready for operations, and the first output of the mill will mark a new era in the industrial interests of the district. It has already had an influence, as it has attracted interest in the district, resulting in a very thorough investigation of the opportunities offered for investment. Several Eastern gentlemen of long experience in various branches of the Iron trade have lately been here in person to inspect the situation, with very satisfactory results. There is very little doubt but that a good slice of the money paid out by the Steel Trust will come to this district for permanent investment in various Iron and Steel industries. Plans are being matured and properties and sites are being investigated. These enterprises will be of sufficient magnitude to materially add to our importance. Development continues on an active scale, without any indication of a let up, and there seems to be plenty of money for investment where probable profit is inducing.

The new shops of the Hardie-Tynes Company are approaching completion, and they will soon be in operation.

At the Dimmick Pipe Works they are crowded with orders, and important orders stand a poor show for acceptance.

The Southern Car & Foundry Company have orders for 2500 cars, besides orders for tank cars for the Texas oil fields. New business is being constantly offered. Our shops engaged in that kind of work are comfortably filled with orders for Tanks for the Texas oil fields and for points in Southwest Louisiana. Orders from the sugar country continue good and the outlook for a further prosperous business could not be better. All of our industries seem to be full of orders and are widening their business territory with constant success.

The Tula Iron & Steel Works & Mfg. Company of Erterria de Tula, Mexico, have been incorporated with a capital of $2,500,000 by E. L. Imhaff, Robert L. Lawrence and Francis McGee.

The Lanyon Zinc Company have started the building of a sheet zinc rolling mill at Iola, Kan.

New York.

NEW YORK, June 5, 1901.

Pig Iron.—There has been very little doing in this district during the last week, and the market is rather easier. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, $16.50 to $17.50; No. 2 X, $15.25 to $15.75; No. 2 Plain, $14.25 to $14.50; Gray Forge, $14 to $14.50; Tennessee and Alabama brands, No. 1 Foundry, $15.25 to $15.75; No. 2 Foundry, $14.75 to $15; No. 1 Soft, $15.25 to $15.75; No. 2 Soft, $14.75 to $15; No. 3 Foundry, $14.25 to $14.50; No. 4 Foundry, $13.25 to $13.50; Gray Forge, $13.25 to $13.50.

Cast Iron Pipe.—Lately new business has fallen off a little, but the shops are very well supplied with work. Prices have hardened somewhat. The largest contract pending in this section is 1500 tons for Brooklyn. We quote $23.50 to $24 per gross ton, at tidewater.

Steel Rails.—The fact that the Cambria interests are now practically in control of the Maryland and Pennsylvania companies, and that the aggregation will work in harmony with the United States Steel Corporation is regarded as specially significant in the Rail trade. Current orders are small and difficult to place. It is reported, however, that low prices are being named in Canada. We quote $28 for Standard Sections, $32 to $32.50 for Girder Rails, and $22 to $23 for Relayers. We quote Spikes, 1.80c. to 1.85c.; Splice Bars, 1.45c. to 1.50c.; Square Track Bolts, 2.35c. to 2.40c., and Hexagon Bolts, 2.45c. to 2.50c., at mill.

Finished Iron and Steel.—The tonnage placed locally has been moderate during the week under review. The most important piece of work pending is the new Library. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.80c. to 1.85c. for Tank, 1.90c to 1.95c. for Flange, 2c. to 2.05c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.50c. to 1.60c.; Common Bars, 1.45c. to 1.50c.; Soft Steel Bars, 1.62½c. to 1.65c., and Hoops, 1.90c. to 2c., base, on dock.

The copartnership heretofore existing between E. W. Ryder, Jr., and Geo. K. Tinker, under the firm name of Ryder & Tinker, has been dissolved by mutual consent. E. W. Ryder, Jr., will represent Morris, Wheeler & Co., and Geo. K. Tinker the Wheeling Steel & Iron Company. The headquarters will remain at 39 Cortlandt street.

Metal Market.

NEW YORK, June 5, 1901.

Pig Tin.—Since our last report the market here has declined about 25 points, in sympathy with a sharp break in prices in the London market on Monday. The decline was stimulated by the statistics of stocks issued by the Metal Exchange for June 1. These figures exhibit an increase for the month of May of 860 tons in the visible supply, which is regarded as an unfavorable showing. The market at the close was weak, with little doing, spot Tin being quoted at 27.85c. bid and 28c. asked. June, July and August deliveries closed at 27¾c. bid. The London market to-day closed at £128 for spot and £125 for futures, a decline of 15 shillings on spot and £2 10s. on futures as compared with last week.

Copper.—No change has taken place in this market. The home demand is still slow, and exports are practically suspended, the European demand having fallen off materially, while prices on the other side rule lower than here. Producers are holding steadily to former figures, Lake Superior Copper for home consumption being quoted at 17c. and Electrolytic and Casting Copper at 16⅝c. The London market has varied very little, closing to-day at £69 6s. 3d. for spot and £69 17s. 6d. for futures. Best Selected advanced 10 shilling to £75 10s.

Pig Lead.—The market here has remained steady

with a fair business doing at the prices of the American Smelting & Refining Company—viz., 4.37½c. for Desilverized, New York, and 4.32½c., St. Louis. The St. Louis market, which was very firm last week, has become quiet. The London market is unchanged at £12 6s. 3d. for Soft Spanish.

Spelter.—The market is in rather better shape, the demand from galvanizers being more active, but prices were unchanged at 3.95c. to 4c., New York. St. Louis was quiet at 3.80c. The London market declined 5 shillings since last week to £17 10s. Exports from New York in May were 2004 tons of Zinc Ore and arrivals 203 tons of American Spelter returned from London.

Antimony.—A fair business is reported and a steady market at 8¾c. for Hallett's and Cookson's at 10¼c.

Nickel—Is still strong and scarce, with 60c. quoted for lots not covered by yearly contract.

Quicksilver.—There is no change. Prices quoted here are $51 per flask of 76½ pounds for lots of 50 flasks or more. The London market is unchanged at £9 2s. 6d.

Tin Plate.—There is nothing new in this market. The current demand is said to be fair and the mills continue to make heavy deliveries on old orders. The American Tin Plate Company are quoting deliveries until October 1 on a basis of $4.19 per box of Standard 100-lb. Cokes, f.o.b. New York, and $4 per box, f.o.b. mills. The market for Welsh Plates is without change at 12 shillings 7½ pence per box for IC Bessemer Cokes, Swansea.

The New York Machinery Market.

New York, June 5, 1901.

Business was exceedingly slow in all sections of the market last week. The strike at the various shops had no effect on deliveries, as the demand was not even of sufficient volume to tax the stocks which merchants have on hand here. Nevertheless, the inactivity is attributed to the strike, as the works of many consumers are closed, and there seems to be an erroneous impression among buyers of machinery that all machine shops are shut down.

The opinion is voiced that under the present demand, or more correctly perhaps, lack of demand, the strike can go on for some little time before a famine in machine tools confronts the trade.

Big deals are noticeably scarce. In fact, we have been unable to hear of a single new one which is actually ripe. The talk about large transactions about to be consummated has died out, and the market is most uninteresting. The amount of straggling small business has even fallen off to a marked extent.

One of the most interesting topics for the future is the proposed navy yard which is to be built at Cavite, near Manila, P. I. It is stated unofficially, but on good authority, that upward of $1,000,000 is to be spent by the Navy Department for machinery alone for this new station. The entire plant, including dry docks, buildings, &c., is to cost about $5,000,000. It is stated that the appropriation for this work will be urged immediately after the next Congress convenes, next fall. The work will, however, be started before this appropriation is made, as there is something left of an old appropriation which can be used for the purpose. Navy yard work in general is rather slow just now, as the appropriations made by the last Congress will not be available until next month.

We are informed that men in authority in the International Steam Pump Company are interested in the Patten Vacuum Ice Company, who are said to be arranging for the erection of a very large new plant. The principal offices of the concern are located at 19 Liberty street.

The order for the pumps to be used in the new refrigeration plant of the Jersey City Cold Storage Company was awarded to M. T. Davidson of 141 Broadway. Six large pumps are included in the order.

There is considerable comment in the trade about the likelihood of another large shipbuilding plant being erected at Chester, Pa. State Senator W. C. Sproul of Delaware County, a son-in-law of the late John Roach, is said to be interested in this latest shipbuilding project, together with one of the officials of the Bath Iron Works whose name is withheld. The proposed company are now being underwritten.

Foundations are now being laid by the Marine Engine & Machine Company of Harrison, N. J., for a new foundry building. The contract for the structural work has already been awarded to the American Bridge Company. The company are now receiving propositions for the electric cranes, cupolas and other equipment which will be required. The matter of installing molding machines and an air compressing plant is under consideration. Miller F. Moore, president of the company, states that the company are also planning for the erection of a large forge shop which is to contain steam hammers, drop hammers and other machinery. The concern intend going into the heavy marine engine business extensively, and the new forge shop will be used in making their own crank shafts and forgings. The machine shop, which is constantly having heavy tools added to it, is now operated electrically by power derived from a local electric light company. It is intended to operate the new departments by electricity also, and then the question of installing a central electric power station will come up. The company have engaged in the building of electric elevators and are extending their shop so that the machines can be put through in large quantities.

The Dundee Textile Company of Passaic, N. J., are about to erect a large plant for the manufacture of cotton goods, and are in the market for boilers, engines and special machinery.

The Morey & Lucas Laundry Company, whose plant at Elizabeth, N. J., was recently destroyed by fire, are arranging for rebuilding. They are looking about for new engines and laundry machinery.

A new factory is being erected at Avondale, N. J., by the Imperial Cutlery Company of Newark, N. J. An entire new machinery equipment is to be purchased, including boilers, engines, power transmission machinery, drops hammers, grinding and milling machines, &c.

Michael Winter of Pittsburgh is erecting a new brewery at Orange, N. J. Proposals are now being received from builders of ice making and refrigeration machinery, engines, boilers, electrical machinery, &c.

The Morris Electric Company, who are erecting a new plant at East Orange, N. J., are about to purchase molding machines and other foundry equipment. Their engines and boilers have been purchased from the Atlas Engine Company of Indianapolis, Ind. The Ingersoll-Sargeant Drill Company have received the order for air compressors, and orders have been placed with various machine tool dealers for iron and wood working machinery.

The Niles Iron & Sheet Company.—The plant of the Niles Iron & Sheet Company of Niles, Ohio, was started on May 30. The plant consists of four hot mills, one 25-inch bar mill, two cold mills, Swindell annealing and gas producing furnaces. The company have a capital of $200,000 and are an Ohio corporation. The officers are: Jas. S. Paterson, president and manager, formerly with the Struthers Iron & Steel Company; H. M. Robinson, vice-president; W. A. Thomas, secretary and treasurer. The capacity is 1000 tons per month. The plant is housed in a steel building 250 x 134 feet. There are two Corliss engines, right and left, 38 x 60. The location is excellent, between the Baltimore & Ohio and Pennsylvania railroads, the company owning a V-shaped strip of land of 25 acres adjoining both railroads.

The Dickson Locomotive Works of Scranton, one of the most important concerns of its kind in the United States, have been acquired by the American Locomotive Company, now in course of organization. The new company now include every contracting locomotive concern in the country except the Baldwin Locomotive Company of Philadelphia.

George W. Wollaston, in charge of the European business of the Joseph Dixon Crucible Company, has been in the United States for the past three weeks, and sailed for London Saturday, June 1.

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING JUNE 5, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing quotations.	Sales.
$10,000,000	Am. Bicycle Co., Com....	.....	.....	.....	.....	- 5	5 - 5½	5½	700
20,000,000	Am. Bicycle Co., Pref.....	.....	.....	.....	-28½	-29	.....	...	500
10,000,000	Am. Bicycle Co., Bonds....	.....	.....	.....	-80	.....	.....	...	2,000
29,000,000	Am. Car & Foundry, Com.	.....	27¾-28½	28 -28⅝	28 -28⅝	28⅛-28½	29½-30¼	29¼	51,200
29,000,000	Am. Car & F'ndry, Pref.§.	.....	82 -82½	82⅝-82⅞	82½-83	83 -83½	83½-85	85	12,100
7,500,000	Bethlehem Iron†.....	.....	.....	-63	.....	.....	.....	...	.....
15,000,000	Bethlehem Steel‡‡.....	.....	21⅛-22	21⅞-22	23 -24¼	23⅞-24½	23⅜-24⅛	23⅝	22,313
7,974,550	Cambria Iron, Phila.*.....	.....	46¾-47	.....	.....	-47	.....	...	175
16,000,000	Cambria Steel**.....	.....	21¼-22	24⅞-26	26¼-28½	28½-29½	29⅜-29¾	29⅜	83,034
17,000,000	Colorado Fuel & Iron.....	.....	96 -99	98 -99	100½-102¾	102 -103	103 -104½	103⅞	75,534
24,410,900	Crucible Steel, Com.....	.....	.....	.....	.....	.....	.....	...	.....
24,399,500	Crucible Steel, Pref.....	.....	.....	.....	.....	.....	.....	...	.....
1,975,000	Diamond State Steel‖.....	.....	- 6⅛	- 6⅛	6⅛- 6½	6⅜- 6½	- 6½	...	4,058
15,000,000	International Pump, Com.	.....	-39½	-39	39½-40	39¾-40½	-40	40	2,700
12,500,000	International Pump, Pref..	.....	-81½	-81¼	-83	82½-82¾	-83	83	900
11,000,000	International Silver.....	.....	.....	.....	- 6½	- 6½	- 6½	6½	300
10,750,000	Penna., new, Com., Phila.	.....	39 -40½	40½-41	36¼-60	50 -55	-53	...	5,496
16,500,000	Penna., new, Pref., Phila.§	.....	80 -81½	81¾-83½	84½-89	88 -89⅞	88¾-89	88¾	7,290
12,500,000	Pressed Steel, Com.....	.....	-46	-45⅞	45¾-46	45½-46	45¾-46⅜	46	7,600
12,500,000	Pressed Steel, Pref.....	.....	-86	85½-85⅞	-86	85½-85¾	86 -86⅞	86⅞	1,600
27,191,000	Repub. Iron & Steel, Com..	.....	19 -19½	19½-19¾	19½-20½	19½-20	19½-20⅛	19½	14,400
20,306,900	Repub. Iron & Steel, Pref..	.....	74 -75	-74⅞	74¾-76	75 -76	75½-76	75¾	7,300
7,500,000	Sloss-Sheffield S. & I., Com.	.....	35 -35½	.....	36 -37½	-37	37 -38	37½	2,100
6,700,000	Sloss-Sheffield S.&I., Pref.§	.....	-81	-81	-83¾	-82½	83 -83¾	83¾	1,700
20,000,000	Tennessee Coal & Iron....	.....	58 -61¾	61 -62⅛	61 -62¾	61 -62½	60 -61⅞	60	15,400
1,500,000	Tidewater Steel‖.....	.....	7½- 7⅝	- 7½	- 7½	7¾- 8	7⅞- 8	8	3,807
506,473,400	U. S. Steel Co., Com.‖‖...	.....	46⅜-48⅜	49½-51	51½-52⅝	50¼-52	50½-52¼	50⅝	574,200
508,486,300	U. S. Steel Co., Pref.‖‖...	.....	95½-97½	98¼-99⅝	99½-100¼	98¾-99⅞	98⅞-100⅜	99	196,300
1,500,000	Warwick I. & S.‖.....	.....	.....	- 7¼	.....	.....	.....	...	200

Preferred stocks 7 % cumulative unless otherwise stated. § 7 % Non-Cu. ‖ Par $10. ‡‡ Par $50, $1 paid in. ‖‖ Authorized Capital $550,000,000 Common; $555,000,000 Preferred; * Par $50. ** $10.50 per share paid in. † 6 % guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph

Bonded Indebtedness: American Bicycle Co., $10,000,000 sinking fund gold debentures 5 %; Cambria Iron Co., $2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Diamond State Steel Co., property leased from Diamond State Steel Co. at 4 % on $1,000,000, $6.25 on Steel stock paid in, $1.25 called for June 1st, total capital $2,000,000; Tennessee C., I. & R. R. Co., $8,867,000 6 %, $1,114,000 7 %, $1,000,000 7 % cu. pref.; Pennsylvania Steel, $1,000,000 5 % Steelton 1st, 1917, $2,000,000 5 % Sparrow's Point 1st, 1922, $4,000,000 consolidated, both plants; Bethlehem Iron, $1,351,000 5 % maturing 1907, interest and principal guaranteed by Bethlehem Steel Co.; Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co., Col. Fuel Co. Gen. Mort. 6 % $850,000, Col. Coal & Iron Con. Mort., 6 % $2,810,000, Col. Fuel & Iron Gen. Mort. 5 % $2,308,000, also outstanding $3,000,000 preferred stock; Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6 %, $2,000,000, Sloss I. & S. general mortgage 4½ % $2,000,000. U. S. Steel Corporation $304,000,000 5 % gold bonds, also Am. S. & W. Co. $130,656, Federal Steel Co. $9,822,000 Illinois 5 %, $7,417,000 E. J. & E. R. R. 5 %, $1,600,000 Johnson 6 %, $6,732,000 D. & I. R. R. R. 5 %, $1,000,000 2d D. & I. R. R. R. 6 %, $10,000 land grant D. & I. R. R. R. 5 %; National Steel $2,561,000 6 %.

Iron and Industrial Stocks.

During the week the United States Steel Corporation stocks have been among the leaders of the general market, the transactions having been large, with an advance which culminated on Monday. The dividend probabilities of the Corporation are being much discussed. There have been heavy sales of Cambria, which advanced from 25 to 29⅝ during the current week.

Philadelphia has had interesting developments during the week, Drexel & Co. making the following announcement: "The stock of the Pennsylvania Steel Company, both preferred and common, in the hands of Drexel & Co. for the underwriting syndicate, has all been sold to investors. The control of the company has not passed to the United States Steel Corporation, but has not been bought with any view of antagonizing their interests. The new owners will operate in harmony with the general interests of the steel trade." The conviction is expressed that the "investors" referred to are parties connected with the Cambria Steel Company, and that in the future both will be operated in harmony with the United States Steel Corporation.

	Bid.	Asked.
E. W. Bliss, common	145	..
E. W. Bliss, preferred	130	140
Cramp's Shipyard stock	85	90
Dominion Iron & Steel Company	33⅞	..
Empire Iron & Steel, common	6	8
Empire Iron & Steel, preferred	30	35
National Enam. & St., common	21⅛	22½
National Enam. & St., preferred	83	85
New Haven	5	5⅛
Otis Elevator, common	32¼	33¼
Otis Elevator, preferred	92¼	94
Pratt & Whitney, preferred	85	90
U. S. Cast Iron Pipe Company, common	40	41
U. S. Cast Iron Pipe Company, preferred	21	22
U. S. Projectile	118	..
Va. C. I. & C., stock	8½	9
Va. C. I. & C., bonds	50	51
H. R. Worthington, preferred	110	114

Dividends.—The Colorado Fuel & Iron Company have declared a quarterly dividend of 1¾ per cent. on the common stock, payable July 15. Books close June 25. This is the first dividend on the common stock since 1893. On February 15, 1901, the company completed the payment of accumulated dividends on the preferred stock.

The Cramp Shipbuilding Company.—At the annual meeting of the directors of the William Cramp & Sons' Ship & Engine Building Company, held in Philadelphia May 31, the quarterly dividend of 1¼ per cent. was declared. All of the old directors were elected and the board re-elected the old executive officers. The annual report of the company for the year ended April 30 compares with the 1900 figures as follows:

	1901.	1900.	Decrease..
Gross	$7,319,000	$7,791,560	$472,560
Cost material, labor, &c..	6,576,000	6,878,560	302,560
Balance	$743,000	$913.000	$170,000
General expenses, interest, &c.	451,228	376,738	*74,490
Balance	$291,772	$536,262	$244,490
Dividends	242,000	242,000	.....
Surplus	$49,772	$294,262	$244,490

*Increase.

The Cambria Steel Company.—The Board of Directors of the Cambria Steel Company have approved the plan for the recapitalization recently announced. A special dividend of $1.50 a share has been declared payable until June 25, to holders of record of June 15, to be paid out of the accrued earnings and applicable only to old stock. Under the new plan the capitalization of the company will be $50,000,000, of which $45,000,000 is to be issued and $5,000,000 reserved in the treasury. The outstanding stock will be exchanged share for share for the new $50 par non-assessable stock. As there are to be issued 900,000 shares of the new stock, there will be 580,000 shares over and above the 320,000 shares required for exchange for the outstanding shares, and stockholders will be allowed to subscribe for the new stock in the proportion of about 180 shares of new for 100 shares of old. The 580,000 shares to be subscribed for will be issued at $22.50 per share.

E. Windsor Richards and Arthur Keen leave for England on the "Majestic" on the 12th inst.

Wooden Forms for Concrete Work.

The best methods of contructing forms for concrete work were described as follows in a paper by C. R. Neher, read before the Engineers' Society of Western New York:

To produce smooth work the addition of granolithic face or plastered surface is unnecessary. Smooth forms, with concrete well proportioned will give just as smooth work at much less cost, leaving the whole mass uniform, without a line of separation, or different compressive strength. Another way to produce finish is to joint the concrete to represent masonry, using rough lumber for forms, then bush hammering the face, which can be done by an ordinary laborer at 1½ cents per square foot, the amount saved by using rough lumber going a long way toward paying for the bush hammering. This removes all impressions from inequality of molds, efflorescence, &c.

The preparation of forms calls for considerable ingenuity, and every contract requires special study, to the end that smooth surfaces be left, with unbroken corners, that the swelling of the wood does not rupture the concrete or leave distorted surfaces, and that the forms be so designed as to be used several times, and readily set up and taken down, and later on converted to other uses. As the charge for forms against the concrete can seldom be kept below 50 cents per cubic yard, for heavy work there is always an opportunity for careful plans, and all depends on the ingenuity of the designer, as few rules can be laid down for his guidance. The use of matched or tongued and grooved stuff is not desirable, as concrete fills in the openings and there is no opportunity to expand from moisture. Unmatched boards dry apart and let the water in the concrete leak out, carrying with it some of the cement, later on they swell and buckle, and if used as interior forms burst the concrete. The best way devised so far is to bevel one edge of the boards, using narrow stuff, not to exceed 6 inches, the sharp edge of the bevel lying against the square edge of the adjoining board allowing the edge to crush when swelling, closing up the joint and preventing buckling.

A coat of soft soap before filling the forms prevents the concrete from adhering to the forms, which should always be scraped and brushed with a steel wire brush when taken down.

Square corners should be avoided as they readily slip off, and where used as interior forms for recesses or cellular construction a fillet should always be placed in the corners.

New Members of the National Metal Trades Association.

In our issue of May 23 we presented a list of members of the National Metal Trades Association. Since then the following firms have joined:

Stilwell, Bierce & Smith, Vaile Company, Dayton, Ohio.

Dayton Mfg. Company, Dayton, Ohio.

Scranton Bolt & Nut Company, Scranton, Pa.

Michigan Bolt & Nut Works, Detroit, Mich.

Jackson & Church Company, Saginaw, Mich.

Fred. M. Prescott Steam Pump Company, Milwaukee, Wis.

M. Garland Company, Bay City, Mich.

A four track Scherzer rolling lift bridge is to be constructed across the Pequannock River at Bridgeport, Conn., after designs and plans prepared by the Scherzer Rolling Lift Bridge Company of Chicago, Ill. The new bridge is to replace the existing double track swing bridge, which will be discarded and removed in the process of four-tracking the main lines of the New York, New Haven & Hartford Railroad Company at this point. The new bridge will be a deck structure, and will consist of two parallel, double track, movable spans, which may be operated together or singly, as desired. The motive power will be electricity, and the bridge will, it is stated, be opened or closed in less than 30 seconds. The bridge will be designed to carry the heaviest loads, in accordance with the specifications of the New York, New Haven & Hartford Railroad Company, of 1901.

The Managers of the Lake Ore Properties.

DULUTH, June 2, 1901.—James Gayley, D. M. Clemson and associates in the mines branch of United States Steel, were at Duluth and on the Lake ranges last week. They were arranging details of organization and were in constant conference with General Manager Cole. Mr. Gayley stated that W. J. Olcott had been given the superintendency of mines on the Mesaba range, a most important position, as the Mesaba will produce nearly as much ore as all other mines combined. Mr. Olcott's knowledge of the range and his experience with the Rockefeller companies makes him most admirably suited for the important position. Mr. Gayley was accompanied to Duluth by Manager E. F. Brown of the Pewabic mine, Menominee range, and it is violating no confidence to say that Mr. Brown will probably have the same position on the Menominee that Mr. Olcott has on the Mesaba. This place was first given to Jas. MacNaughton of the Chapin, but he has now become general manager of the Calumet & Hecla and moves to the copper country at once. This is one of the most important positions in the mining world, and it is a tribute of no mean character to Mr. MacNaughton and the mine from which he goes. He is but 39 years old, took a partial engineering course in the University of Michigan and became an engineer at the Calumet & Hecla. Before the Hanna interests took the Chapin he was assistant superintendent there and shortly after they took the property, he was made general manager. T. F. Cole was first employed in the place, but Mr. Schlesinger did not want to give him up and he soon went back to the Schlesinger group. Mr. MacNaughton is one of the biggest and broadest men in the Lake country and abundantly deserves the splendid success he now has.

Messrs. Gayley and Cole will select offices for general headquarters of the mines in which all the companies—the Oliver, Minnesota, Consolidated and American—will be together. Now they are scattered about the city. As to the American, Captain Sellwood will probably continue to direct their movements for the present year, but he is anxious to retire and will do so as soon as convenient. He has done some notable things the past 12 months with mines of his company, notably at Negaunee, which presented some terrific problems, and at the Atlantic. Negaunee is now hoisting 1300 tons daily off a level abandoned when he took charge, and the only shaft to which was on the point of caving when he took charge. In sinking a new shaft he did record work in getting through a heavy depth of quicksand.

It would not be surprising if there should be some unpleasant revelations in store for some of the mining towns. In so far as is possible, the policy of the steel combination is likely to eventuate in getting their requirements of ore from as few mines as may be. This will have less effect on old ranges than on the Mesaba, where it will be possible to make some saving. There are a good many arguments in favor of pushing production and having not many extra openings. But such may be the necessity for production that this policy cannot be carried to any great extent. D. E. W.

The iron ore rate cases in Minnesota will come up in July and will be as warmly contested, say the roads, as though there was no overshadowing ownership of mines and roads. So far as the Duluth & Iron Range and Duluth, Missabe & Northern are concerned, the fight is more a matter of principle than of financial consideration. However the fight may go, it is not improbable that the Minnesota rates will be moderated before long.

The J. P. Wetherill Machine Company of Chester, who have been doing business for some years, have dissolved partnership by mutual consent. John Wetherill retires from the concern and Isaac Wetherill, his son, takes his place. The business will be conducted under the same name as heretofore.

HARDWARE.

The Hardware merchant who desires to find ground for the contention that the trade is being limited and curtailed and in general made difficult and unprofitable by the changes which have taken place in business will not have far to go for facts with which to support his argument. But it would be unwise to expend much time or energy in reflections of this character. It will rather be the part of wisdom to recognize the manner in which the changed conditions put new opportunities within his reach. A survey of the whole field will probably lead to the conviction that the Hardware field is as broad and as promising at this time as it has ever been, and that there are abundant opportunities in it for the exercise of enterprise and skill and the attainment of a good, if not a large, measure of success. While certain lines of trade are less remunerative than they were a generation ago, and certain lines then prominent have taken a very subordinate place, it still is true that many opportunities are opening up before the alert and enterprising Hardware merchant which are full of promise. Some of these are referred to below:

BICYCLES.—This is one of many lines in which a relatively new class of goods offer themselves to the Hardware merchant. The Bicycle business carries with it calls for Fittings, accessories, Padlocks, Wrenches, Call Bells, Lanterns and numerous other items, all of which it is the natural province of the Hardwareman to furnish. After a brief meteoric career, the Bicycle business has settled down to a steady, legitimate trade, and the Hardwareman who neglects it is also neglecting his opportunity. In this new business especially it will be found that the Hardware dealer will have gained more than he has lost.

ELECTRICAL GOODS.—The sale of Electrical Supplies and Appliances interlaces with that of Hardware Implements and is essentially a part of the same business. The business is yet in its infancy, and its development promises to be among the industrial wonders of the age. The wise Hardware dealer is he who is long headed enough to corral this business before it drifts away into separate and distinct channels, as it certainly will do if neglected. All it needs for its successful prosecution is a moderate technical knowledge—a requisite which offers no impediments to any one who has mastered the complexities of Hardware. There are other kindred industries—always more or less allied to Hardware—which, while they have reached their meridian and are slowly declining, yet promise to be with us in considerable volume for an indefinite period. A case in point is the Harness and Saddlery business, which, from reasons too well known to recapitulate, has seen its best days, yet will always be of importance. It no longer offers the same inducements as formerly for a separate calling, and nothing is more natural than that the Saddlery shop should be absorbed by the Hardware dealer to the advantage of both, especially in view of the better class of more profitable goods now being sold in this line. To the Hardwareman it is simply an increase in variety of a line hitherto only carried in part.

SHEET METAL WORK.—A similar case is that of a complete alliance with the tin shop, for it has always existed more or less in part. With the advent of the great stamping manufacturers the tinsmith as a separate factor is no longer either possible or necessary, especially as the trade in finished Tinware is already an integral part of the Hardware business. With the tin shop goes naturally the handling of Stoves and Fittings and that fast increasing line of Metal Work, especially in Galvanized Iron for building purposes.

WOODEN WARE, ROPE, &C.—There are certain articles of utility which, for reasons not easy to perceive, have been handled by lines of trade with which they naturally have nothing in common, such as the sale of Wooden Ware, Rope and Twine by the grocery dealers. That they should be drifting into the hands of the Hardware dealers is natural enough, and the live Hardwareman should be ready to take full advantage of this fact.

SPORTING GOODS.—The great growth of national life has not only given enormous expansion to certain lines of trade, but has completely changed them by the addition of new features, and this is particularly true of Sporting Goods. The Hardware dealer has always been headquarters for the staples in this line, and he has now the opportunity of embracing all the good things in this line. Why should he be content to sell Shot and Powder and Metallic Cartridges and abandon the cream of the business in Baseballs, Fishing Tackle and a thousand sundries to the stationery dealer, the druggist and the small Sporting Goods man? To him by right of heritage belongs the whole business—from Shot Guns to Golf—with its present profit and its wonderful promise of the future. The following of out door sports by us as a nation is but in its infancy, and these sports mean the absolute creation of a vast amount of new business. It should not matter to the dealer whether a new game be a permanency or merely a fad, since his is the part to exploit it for his benefit while the craze lasts.

PAINTS, GLASS, &C.—A further field is afforded by essential changes in a line which remove its complexity and place it within reach of the layman, as well as the professional—such has been the case in the Paint line by the introduction of Mixed Paint, so that now the entire Paint business, with its accompaniments of Window Glass and Oils, is in easy reach of the Hardware dealer.

MACHINISTS' TOOLS.—Other promising fields of exploitation are those industries which are along the lines of the growth of our industrial life, and none are of greater importance than Machinery, Tools and Supplies. Some intelligent study and a moderate degree of technical knowledge are all that are needed to buy and sell the goods to advantage.

Condition of Trade.

THE business situation presents no important features of novelty, trade continuing in fair volume and with an excellent tone. Merchants throughout the country are giving attention to the marketing of goods, and stocks being generally sufficient for present requirements there is not much doing in the way of buying, either by the jobbers or the retailers. The demands made on stocks are, however, such as to call for frequent sorting up orders, so as to keep them up to a good working size. The matter of strikes is causing some solicitude and is recognized as an element of uncertainty. While it is hoped that existing difficulties may be adjusted before long, some manufacturers refer to something of a restlessness on the part of their workmen which may manifest itself at any time. The slackening in the demand for goods is on this account, as well as the relief which it gives factories who have been running for a long time, regarded without special regret. Stocks in the manufacturers' warehouses are generally low or depleted and an opportunity to bring them up so as to be in shape to meet promptly the requirements of the trade will be welcomed. In the meanwhile the condition of the Iron market is being carefully watched, as this is so important an influence on the cost of goods. The policy which is generally pursued by careful and conservative houses is that of purchasing goods to cover their early requirements with reasonably liberal orders.

Chicago.

The month of June opens auspiciously, the volume of business being up to the full standard of the preceding weeks. Jobbers are obliged to work their entire

force at night for two or three evenings a week to keep pace with their orders. Difficulty is still experienced in getting a sufficient supply of goods in many lines, but shipments seem to be growing a little better. It is believed that within a few weeks at furthest stocks will once more be equal to the regular requirements of the trade. In some branches, notably in Barb Wire, the jobbers have recently been requesting their representatives to take no fresh orders, as they have many orders still to be filled and the end of the season is approaching, when dealers will be unable to dispose of what they may receive if shipments should be delayed. The movement of Sheets and Metals, Tinners' Stock, &c., is fully as heavy as during May, and considerably greater in volume than at the coresponding time last year. Advices from the agricultural interests are of the most encouraging character, and it is believed that abundant crops will form an excellent basis for expecting a continuance of good trade.

St. Louis.

(By Telegraph.)

The Hardware trade is to a certain extent feeling the effect of the summer season, which has now set in, and yet no complaint is heard, as the usual summer dullness is not expected to be quite as noticeable as in previous years. There is at present a large movement in Binder Twine, which is quoted by the jobbing trade at from 7¾ to 8 cents. Retailers who have neglected to enter their orders early now find it difficult to secure any kind of satisfactory shipment without paying full price, as manufacturers have their books already filled and are not looking for much new business. The famine in Barb Wire continues and there is apparently no immediate hope of any improvement in this direction. Bolts and Nuts are in heavy demand. A leading jobber recently corresponded with every Bolt manufacturer in the country asking for prices, and was advised that no order could be entered for shipment for at least 60 days and possibly longer. This answer was received from practically every Bolt manufacturer written to. Sheets continue difficult to obtain, and complaints from jobbers and dealers are daily heard regarding their inability to secure deliveries on orders entered many weeks since.

Boston.

Bigelow & Dowse Company.—When one considers that this is the first day for over two weeks, and the third time during the past month, that the sun has shone in our office at 3 o'clock, some conception may be gathered of the disagreeable weather conditions that have prevailed throughout New England all the spring. The rains have filled the streams for the lumbermen to get the logs to the mill, with power in reserve to cut them. The farmer is insured a bountiful crop of hay, but views with sorrow the loss of his first planting of corn, and while the season is a month late for products of the soil dependent on warm weather and sunshine, on others it is far advanced.

Trade in March and April was disappointing, but May has come nobly to the front, and it is hoped that it is duly the forerunner of continuous prosperous business for the months to follow.

There are good reasons for a falling off in the sales of Bicycles, but it is hoped that fair weather and dry roads will stimulate the buying, and that the close of the season will show a sale equal if not greater than that of last year.

Barbed Wire Fencing was never popular in New England and its sale there has never been in proportion to other sections of the country, but the advent of the Woven Wire Fence meets the demand for a cheap, sightly and strong protection for farms, and the various styles of Wire Picket Fences are an ornamental protection for the home and the sales are constantly increasing. There are no indications at present of any marked decline in the prices of staples or of general Hardware. A firm, steady market insures confidence and good buying.

The criticisms of the selling policy of the manufacturers of Builders' Hardware are just and reasonable, and while present conditions exist they must continue until they consolidate under one management which shall consider its part to manufacture at an economical cost and leave the marketing of their goods to the wholesale dealers, who may themselves combine as distributers to the retail dealers, whose profits shall be insured to them by a positive protection, either from the wholesale dealer or from the manufacturer.

This plan would increase the manufacturers' profits by eliminating all the expenses of selling, which would be transferred to the corporated jobbers, whose expenses would be greatly reduced by consolidation, so the retail dealers would buy their goods at a less price, and they would be protected and insured against any competition between them and the consumer. Is not such a condition possible ?

Philadelphia.

Supplee Hardware Company.—No diminution in the volume of business in wholesale trade circles is visible since our last communication to *The Iron Age*. There is now, and has been for some little time, a scarcity of certain kinds, sizes and styles of some goods from which the jobber suffers when his stock has become depleted or exhausted from the fact that manufacturers are usually found with a shortage of stock at the same time, and on which time alone can solve the problem. The retail merchant, on his part, however, cannot realize the difficulties that the jobbers (who try to anticipate all wants) encounter in this respect.

The backwardness of the season in the early months caused a delay in some of the retail trade making up their orders, and when goods were needed for immediate wants there was uncertainty and delay in securing prompt shipment. The spring season has now practically passed into summer, and all back orders will doubtless soon be completed and enable the jobber to replenish his stock during the months of July and August for the fall campaign.

There appears to be nothing but encouragement in the outlook for the future, and but few changes in prices are at the present time noticeable. Collections are fair.

Louisville.

W. B. Belknap & Co.—Business has been somewhat retarded by the extremely late spring and the cold and wet weather. The lowlands along many of the river bottoms have been overflowed for the second time, involving damage of a serious nature in their localities. The "blackberry winter of our discontent" has been accepted as a truer expression than the original Shakespearean line. However, there is some compensation in it all for the strawberry season will be prolonged and the laundry bill for tow linen suits and seersuckers reduced in its totality.

There is still a most excellent demand for goods, particularly in staple articles, which go for mining and the exploitation of new territory generally, for oil, coal, railroads, &c.

Electric lines branching out from more important centers and joining minor towns seem to be the order of the day, so that the future map maker will have to devise a new symbol on his pages for this class of transportation, and it promises to cover the whole country like a fine network.

In short, there seems to be no diminution of new enterprises, and of course that means the use of an immense amount of goods. The strikes in the various cities are hardly looked on as serious. And indeed thus far they are not so serious as they would have been in former years. It is only another evidence of prosperity that they have cut so little figure. With the wages that are paid to-day there is every temptation for men to go to work and to keep at work. In fact there is very little dissatisfaction with the wages. The main struggle seems to be a sentimental one largely—viz., for recognition of the unions as such. That there is a more temperate tone to disputes of this sort is evidenced etymologically by the adoption of the word "unfair" in-

stead of the former opprobrious epithet that was applied to material produced outside of the union. While it may not be descriptive, it has much to recommend it which the word "scab" did not. In short, we hope to see this latter word ruled out of reputable print, as it should have been long since.

One of the best signs in the trade is the extraordinary demand for farming tools. It seems as though not only a larger acreage would be worked but that whatever was done would be done under the most favorable conditions, as the implements demanded are of the latest and most improved patterns.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—May has fulfilled its early promises, and the month closes with the heaviest business of any month so far in this year. Crop prospects are still of the best, foreshadowing an unusually good fall trade.

There is more complaint of poor collections in some sections than should exist, owing to low price of wool and buyers and sellers being apart on cattle and sheep. However, we know the wool is in warehouse and stock on range, making a good solid basis for credit.

Our timber interests continue to attract more and wider attention every month, and large sales are recorded almost daily.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—In its general features this market presents no changes of importance. There is a constant and steady demand for goods, both from the agricultural and mining districts, so that jobbers are well satisfied with the present conditions, as well as the future outlook. There appears to be plenty of money in circulation, and as the general prosperity has brought about a large expansion in the consuming power of the masses the retail trade of this trans-Missouri region has received its full share of the benefits.

There is still a serious shortage of certain staple lines of Hardware. It is recognized that the demand is unusually heavy, at the same time appearances would indicate that the production of certain staples was being purposely manipulated by the controlling interests, with a view of keeping the supply below the demand. In consequence prices are very firm and it is probable that no radical changes will occur for some time.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business for May was most satisfactory in every respect. Sales showed a large increase over last year and collections were very heavy.

Many salesmen will take their vacations during this month and things will therefore be a little quiet, but indications are that beginning July 1 the Hardware jobbers at the South will enjoy the largest business in their history. All crop prospects are fine.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—May trade closed very satisfactorily. The demand for goods has never been better. Trouble continues in getting some lines of goods, such as Barb Wire and Woven Fencing. Prospects for the month of June are excellent if crops come on favorably.

NOTES ON PRICES.

Wire Nails.—Activity in the demand for Wire Nails is not so pronounced as for some weeks past. Mills are now in a better position to make shipments promptly. Quotations remain unchanged as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.30
To jobbers in less than carload lots	2.35
To retailers in carload lots	2.40
To retailers in less than carload lots	2.50

New York.—The trade tributary to this point are not ordering Wire Nails quite as freely as during the early part of May. Quotations are as follows:

To retailers, carloads on dock	$2.53
Small lots at store	2.60

Chicago.—Manufacturers of Wire Nails are in position to make somewhat better shipments than for some time, but report a continuance of good orders. Some very heavy specifications have been received by the leading Wire Nail manufacturers the past week, indicating that the demand from the usual distributing channels has not seriously fallen off. Jobbers report a continued good trade both from local buyers and the country at large. Carload lots are quoted at $2.45, and small lots at $2.55, with a concession to $2.50 to best buyers.

St. Louis, by Telegraph.—Manufacturers and jobbers report a good demand for Wire Nails, but not sufficiently heavy to cause mills any difficulty in making prompt shipments. Jobbers quote carload lots to retailers at $2.55, base, and less than carload lots at $2.60 to $2.65, base.

Pittsburgh.—The demand for Wire Nails is not as active as it has been, but a fair amount of new orders is being received. There is no intimation of any change in prices. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.30
To jobbers in less than carload lots	2.35
To retailers in carload lots	2.40
To retailers in less than carload lots	2.50

Cut Nails.—The demand for Cut Nails continues fair. There appears to be less irregularity in prices since the recent meeting of manufacturers. The market is represented by the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots	$2.00
Less than carload lots	$2.05 to 2.10

New York.—The demand for Cut Nails is in about the usual proportion to that of Wire Nails. New York quotations for carload and less than carload lots are based on the above prices, to which Pittsburgh freight has been added:

Carload lots on dock	$2.13
Less than carload lots on dock	2.18
From store	2.23

Chicago.—The demand for Cut Nails is very good within the usual limits, but the city trade is taking more than the country. Jobbers quote small lots at $2.35.

St. Louis, by Telegraph.—There continues to be a satisfactory trade in Cut Nails. Some irregularity in prices is noticeable, especially where round lots are involved. Jobbers quote small lots at $2.30 to $2.35, base.

Pittsburgh.—May prices of Cut Nails have been reaffirmed for June delivery. There is a fair demand, and the slight unevenness in prices referred to in previous reports has, it is claimed, entirely disappeared. The market is represented by the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots	$2.00
Less than carload lots	$2.05 to 2.10

Barb Wire.—The requirements of the trade for Barb Wire are less urgent in some parts of the country, while in others manufacturers are unable to make shipments promptly. In the West the mills are still two or three weeks behind orders. It is anticipated, however, that this condition will be overcome in a short time. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted	$2.60
To jobbers in carload lots, Galvanized	2.90
To jobbers in less than carload lots, Painted	2.65
To jobbers in less than carload lots, Galvanized	2.95
To retailers in carload lots, Painted	2.70
To retailers in carload lots, Galvanized	3.00
To retailers in less than carload lots, Painted	2.80
To retailers in less than carload lots, Galvanized	3.10

Chicago.—Manufacturers of Barb Wire are in such condition that if they were not to receive any fresh orders it would require probably up to the middle of July to enable them to fill specifications now in hand.

Every day, however, sees a little gain on deliveries, and it is expected that within a short time complaints will be much less numerous of slow shipments. Local jobbers report a remarkably well sustained demand, but are now instructing their representatives not to take fresh orders, owing to the difficulty experienced in filling those already booked. The end of the season is approaching and they prefer not to receive orders now on which shipments may be delayed so far in the future as to subject retailers to the necessity of carrying stocks over for another season. Carload lots are quoted at $2.75 for Painted and $3.05 for Galvanized. Less than carloads are quoted at $2.85 and $3.15, respectively, with a shading of 5 cents to the best trade.

St. Louis, by Telegraph.—There has possibly never in the history of the Barb Wire trade a condition existed as at present. Barb Wire is simply impossible to obtain, except in such small quantities that it is sold as soon as notice of shipment from the mill is received. Manufacturers are doing all they can to relieve the situation, but are weeks behind their orders, and jobbers are losing business daily on account of their inability to make shipments. Jobbers quote carload lots of Painted at $2.85 and Galvanized at $3.15. Less than carload lots are quoted at $2.95 for Painted and $3.25 for Galvanized.

Pittsburgh.—There is a fair amount of business, but the mills have caught up on back orders and are making prompt deliveries. For domestic trade we quote: Galvanized Barb Wire, $2.90 in carload lots to jobbers, and Painted, $2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—Demand for Plain Wire continues in large volume. The manufacturers expect to be able to make shipments more promptly in a short time. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots	$2.25	$2.65
To jobbers in less than carload lots	2.30	2.70
To retailers in carload lots	2.35	2.75
To retailers in less than carload lots	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances.

Plain Fence Wire Advances (Catch Weights).

Nos.			Galvanized.
6 to 9	Base		$0.40 extra.
10	$0.05	advance over base	.40 "
11	.10	" " "	.40 "
12 and 12½	.15	" " "	.40 "
13	.25	" " "	.40 "
14	.35	" " "	.40 "
15	.45	" " "	.75 "
16	.55	" " "	.75 "
17	.70	" " "	1.00 "
18	.85	" " "	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Chicago.—The Wire mills are well filled with contracts for Plain Wire, which will probably require their full capacity for the next month or more. They, however, are gradually getting into better shape on deliveries and expect shortly to be in a position to satisfy their customers with prompt shipments. Carload lots are quoted at $2.40, base, and small lots from stock at $2.50, with $2.45 quoted to the best trade.

Pittsburgh.—Demand for Plain Wire continues very heavy and prices are firm. For domestic trade we quote:

	Plain.
To jobbers in carload lots	$2.25
To jobbers in less than carload lots	2.30
To retailers in carload lots	2.35
To retailers in less than carload lots	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, $1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Files.—Under date of June 1, the Nicholson File Company, Providence, R. I., issue a new price-list of Swiss Pattern Files, in their X. F. and Gold Medal brands. The new list is 10 per cent. higher than the company's list of January 1, 1898, which it supersedes. The present discounts will apply to the new list.

Glass.—The local Glass market remains dull. It is understood that manufacturers have not shipped Glass covered by the last orders of the jobbers, and the opinion is expressed that Glass, especially the smaller sizes, is likely to be scarce before factories start in the fall. It is reported that the Pittsburgh Plate Glass Company will market the product of co-operative factories next fire, on commission. With the Window Glass market in control of the American, Independent and Pittsburgh companies, prices are likely to be maintained. Now that the Belgium Glass strike is ended, the importation of Glass may force a reduction in the price of large sizes to some extent. The statement is made that the Treasury Department has announced that no back duties will be collected on imported Glass, but that the new rule will be enforced on future shipments, unless the decision can be overruled. Jobbers' quotations for domestic Glass continue without change, as follows:

	Discount.
Less than car lots, from store	80 and 20 %
Carloads, f.o.b. factory	85 and 5 %
3000 boxes, f.o.b. factory	87 %

These prices are for single or double strength, and cover the entire country.

Paints and Colors.—*Leads.*—Unfavorable weather conditions have had the effect of curtailing local demand. This is also true of other sections of the country. A fair business has been done for June delivery, with prospects for an increased demand with settled weather. No change in quotations has taken place, and are as follows: In lots of 500 pounds and over, 6½ cents; in lots of less than 500 pounds, 7 cents per pound.

Oils.—*Linseed Oil.*—For some time the Linseed Oil market has been in an unsatisfactory condition, owing in part to unfavorable weather. Opinion is divided as to the future trend of prices, if the consolidation of the American and Union companies takes place. Quite a large amount of Oil has been taken on contract, and improved weather has shown an increase in orders for small lots of Oil. Out of town brands of Raw Oil are quoted from 59 to 60 cents, according to the seller. City Raw is firm at 61 to 62 cents, according to quantity. Boiled Oil is 2 cents per gallon advance on Raw.

Spirits Turpentine.—Turpentine has ruled dull, without material change in values during the week. Demand has been for small lots, as large consumers are not in the market at present prices. Quotations are as follows, according to quantity: Southerns, 35½ to 36 cents; machine made barrels, 36 to 36½ cents per gallon.

MAYER & CO.

MAYER & CO., Philadelphia, established in 1899, claim to be the original manufacturers of the Gold Medal Files, for which they were awarded the Elliot Cresson gold medal by the Franklin Institute, Philadelphia, and it is from this award, they say, that the trademark Gold Medal was adopted. They state that they make a specialty of high quality Files and Rasps, which have been carefully tested with a hard prover and are guaranteed perfect. Owing to the increasing demand for their product they are about enlarging their plant; additional buildings are to be erected and equipped with the lastest improved machinery, engines, &c., whereby their facilities for production will be greatly increased. "Mayer & Co.," or "M. & Co.," are stamped on all their Gold Medal Files.

Aberdeen Hardware Company are successors to Wells & McCaughey, wholesale and retail dealers in Hardware, Stoves, Tinware, Sporting Goods, &c., Aberdeen, S. D. The new firm are adding materially to the size of the establishment, and when the improvements under way are completed will have a store 50 x 142 feet in dimensions.

Southern Hardware Jobbers' Association.

THE eleventh annual convention of the Southern Hardware Jobbers' Association is now in session at the Battery Park Hotel, Asheville, N. C. The association began its work on Tuesday morning, 4th inst., there being a good attendance of members and manufacturers and their representatives. About 30 ladies also graced the occasion with their presence.

OPENING SESSION.

The meeting was called to order by the president, J. D. Moore of the Moore & Handley Hardware Company, Birmingham, Ala., after which "America" was sung by those present. After the calling of the roll Mr. Moore welcomed the delegates and other visitors in the following address:

PRESIDENT MOORE'S WELCOMING ADDRESS.

By virtue of my position it becomes my duty, from which I derive the pleasure, of extending to you a cordial welcome to this, the opening of our eleventh annual convention.

This is the land of the sky, and we have made a good start toward the happy place where all the good people go and which is understood to be situated on high. May we finally complete the journey by going all the way, and may not one of this goodly crowd be left behind. I rejoice to see so many ladies who have come to cheer us, while we are studying the laws of trade and cultivating the laws of good fellowship, which shall in some degree soften the rough, keen edges of fierce competition and make business more pleasant and more profitable. You notice I emphasize profitable, since this is important in making a success.

You may think it a little singular that an Alabamian has come to North Carolina to welcome people to her soil and extend the freedom of her privileges, but I feel that I have some right here. My maternal great-grandfather, George Dismukes, was a pioneer in this State, and was major in the Revolutionary War and helped to win some of the liberties we all enjoy. My father was born in this State, and used to entertain his children around the fireside of a wintry evening, as we enjoyed the bright blaze of the Georgia pine knots under the large sticks of wood in the old time fire place, with the wonderful stories of the great people and the great things he saw and learned in this old North State when a boy. This has long made me want to climb her hills, drink her pure, clear water, and fill my lungs with her abundance of ozone, which renews our youth and keeps us ever young.

Here we are in the leafy month of June, met under auspicious circumstances at this Mecca of health, surrounded by all that is pleasant, to study how to make life more agreeable and profit by the exchange of ideas which are the soul of good business. We are glad to see the manufacturers and have them come to renew their friendship and make them stronger than ever, and to give us the benefit of their presence and their counsel. The manufacturers and jobbers are necessary to each other and can help each other by cultivating close friendship, and we are glad to see this recognized by your presence among us. We would not be happy without you, and we want you to have a good time.

We are glad to see and to welcome the large body of commercial travelers, whose business it is to mediate between the manufacturers and jobbers. They are essential to both. A few years ago, when the great combinations or consolidations began forming which have not yet ceased, we all wondered what was to become of the commercial travelers, and thought at first that there would be no longer need for them, but we are glad to find that we were mistaken, and that there has never been found any agency so potent as the audible, living voice as a mediator between the manufacturer and distributer.

We hope while we continue in business that there will never be found anything to take their place. Some of our strongest friendships and warmest attachments are found among these men. I am glad to have them come to see me, and I am glad to have them here to take part in these, our annual conventions.

So, ladies and gentlemen, I am commissioned to extend to you all a hearty welcome and bid you have a royal good time, and take away from this place only the most happy recollections.

I now commend you to our most excellent Entertainment Committee, of which Irby Bennett is chairman. He has served in this capacity since our organization was first started, and all of those who have attended our former meetings and observed his excellent work will, I am sure, agree with me that he is the right man in the right place. You will observe the other members of the committee by their badges, and I am sure that any of these ladies or gentlemen will consider it a favor to have you make any request of them that will add to your pleasure while here. I am glad to note that we have this year added a new departure from former customs, and have a committee of local ladies who will be glad to assist in making the occasion even more pleasant for the ladies and others.

Mr. Moore was followed by Louis M. Bourne, who welcomed the association on behalf of Asheville.

An eloquent address of welcome to the manufacturers present was made by Col. B. F. Eshleman of Stauffer, Eshleman & Co., New Orleans, to which W. R. Walkley of the Peck, Stow & Wilcox Company, New York City, responded on behalf of the manufacturers.

W. R. WALKLEY'S RESPONSE.

From Mr. Walkley's response, which was in rhyme from the opening to the close, and was received with many manifestations of appreciation, we make the following extracts. Many parts were of a personal character, having reference to individual members of the association, and the points thus made were thoroughly enjoyed. After the opening verses referring to the natural surroundings, Mr. Walkley thus spoke in his address to the president:

When one's elected to preside
O'er a body democratic,
Some one is very apt to chide
Or call the choice, at least, erratic.
* * * * * * * * * * * *
Our better thoughts reach up to Heaven;
Our better lives touch kingly souls;
The brightest jewel God has given
Is friendship pure, which love controls.

'Mid all the cares of business life
Such noble thoughts have been thy aim,
A soldier still in eager strife,
Thou lovest best an honored name.

A graceful tribute was paid to the ladies, many of whom were in the audience, and congratulations extended to the convention on its usefulness. From his "Message of Good Tidings" and his plea for honest men and honest methods, we are permitted to give the following:

I wish I could speak each man's name
In all this gathered throng;
I'd write it high on scroll of fame
And thus conclude my song.

For where in all this goodly land
Such manhood will you find,
Or such extended welcome hand
Which ties of friendship bind?

Love conquers figures all the time,
Business toils for beauty;
A sacrifice is oft sublime
When made in line of duty.

These manly men of manly parts
Figure discounts often;
Yet Cupid's arrows reach their hearts,
And all the hard lines soften.

* * * * * * * * * * * *

I bring you glad tidings of a nation at peace,
Its rule most benignant, its people content;
The soil yields the farmer abundant increase,
We thank the All Giver for the blessings He's sent.

We bring you glad tidings of a country at peace,
The dull beat of war no longer is heard;
Yet the songs of her triumphs shall ever increase,
Awakening sweet music like the notes of a bird.

From river and mountain, from hill and from glen,
A voice of thanksgiving ascends to the skies;
To Him who hath made us the ruler of men,
Our praise in grand chorus shall ever arise.

I bring the sweet music of spindle and loom,
Of the anvil and plow, of the mill and the shop;
Industry still builds to give enterprise room,
Shall the march of our progress never find stop?

The flowers of the springtime with the love of our hearts
We bring to these toilers in life's busy fields;
Their fragrance, the spirit which ever imparts
The courage and valor which trueheartedness yields.

* * * * * * * * * * * *

The streams are still turning the wheels of the mill,
The stones are still grinding the wheat of the field;
Life's currents are running, but when 'tis God's will,
The heart shall cease beating; to Death must Life yield.

I plead for men of sterling worth,
For business methods pure and clean,
For honesty throughout the earth,
For fairest dealing though unseen.

For weights and measures quite exact,
For plan and purpose unobscured,
For statements one will not retract,
For noble triumphs thus secured.

I plead for men who think and act,
Whose plans in life touch high ideals,
Whose judgments rest on solid fact,
Are not reversed by base appeals.

I plead for men, though young in years,
To watch the rising star of hope,
To struggle on through doubts and fears,
Quite soon a brighter day will ope.

I plead for men who dare and do,
Who shirk no toil that duty gives,
Who ever to the truth are true,
And in whose hearts the truth still lives.

The world needs men to till the soil,
To sow the seed, to scatter grain,
To reap rich harvests from their toil,
To plow and plant and reap again.

The world needs men to build highways
Across its plains and o'er its hills,
Who count by deeds, and not by days,
The place in life their being fills.

The world needs men upright and just,
Who will their faith nor hope deny,
Who in their Maker put their trust,
And for His truth will gladly die.

* * * * * * * * * * * *

Weaver at the loom of life take good care
That broken threads ne'er pass thy watchful eye;
Note the shuttles backward, forward flying,
Living best is best prepared for dying.

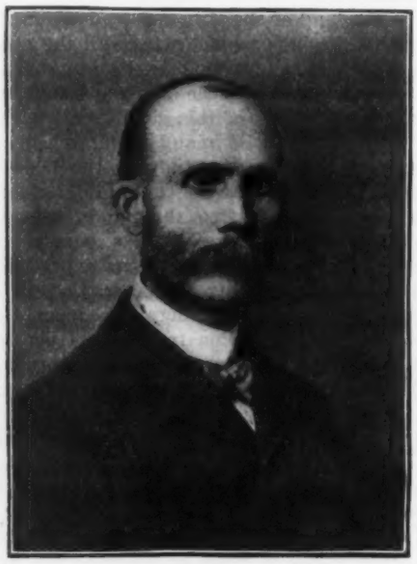
President Moore followed with his annual address, which was as follows:

THE PRESIDENT'S ANNUAL ADDRESS.

I am pleased to see this large representative body, gathered from a territory bounded on the north and east by the Ohio and the Potomac and on the southwest by the Rio Grande. We have turned aside from the active duties at home—traveled many miles in order to spend a week in the exchange of ideas and endeavor to better qualify ourselves for the work of the future. We have done this now for 11 years and each year our numbers increase, which would indicate that we are making progress and that we have discovered the important lesson of helping ourselves most when we help each other. When we started the idea was abroad in the land that competitors in the same line of trade could not be close friends, but from experience and contact we have discovered something of the value of good fellowship. It is natural at this, our first meeting of the new century, that we stop and review what we have done in the past and see if we may find some lessons to guide us for the future.

These are Certainly Wonderful Times

and we are repeatedly surprised with changes in the industrial world for which we know no precedent. Commerce seems to lead the way in teaching the great efficiency of co-operation and is giving many examples of how profitable it is to be united. We readily see the great power thus exerted, and stand in awe and fear that evil rather than expect that good will come of them. So far we have not seen any great evil except such as often follows genuine progress. We have been studying the great problem of industrial combinations for several years. They came upon us so unexpectedly and with such rapid succession that we were stunned and bewildered. We feared that they meant great evil and have not yet fully satisfied ourselves whether they are a blessing



J. D. MOORE, President.

or a curse. New ones continue to appear and give evidences of being permanent. They are the beginning of a new era. It behooves us to study them closely and see if there is any good in them.

Origin of the Association.

It may be profitable for us this morning to revert to the origin of the Southern Hardware Jobbers' Association and see what it was that gave us a start. My information is that just across the mountain here at Knoxville, about 13 years ago, the jobbers of that enterprising city decided that they would form a local association with the idea in view of regulating prices and making them uniform, thus stimulating to excellence in service rather than cheaper price. The idea was good and worked well, but after a short while they discovered that more good could be obtained by extending their borders and all the jobbers of the State met in Nashville to form a State association. Discussion developed that it was difficult to fix a boundary of their influence and they decided to cover the entire field south of the Potomac and Ohio rivers and christened the Southern Hardware Jobbers Association.

Development of the Association Idea.

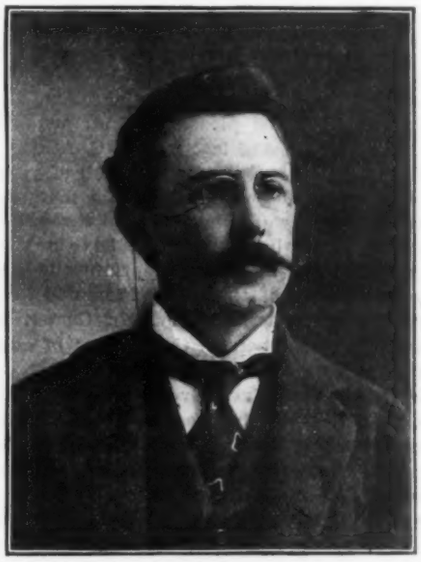
So far is I know, this was the first interstate Hardware association formed in the United States, and as to what success we have had you have but to view this large and representative gathering and inquire into our

history. Our ideas have been indorsed until this broad land of ours, from the Atlantic to the Pacific, is covered with Hardware associations and the largest of them the National Hardware Association, which unites in one membership representatives from Maine to California and from the lakes on the North to the Gulf on the South. The idea was too great to be bounded by such narrow confines and it has gone over to our Canadian brethren on the north and also crossed the Atlantic to the British Isles and to Australia.

The influence has not stopped here, but has extended to the retail Hardware trade, who have for some time been forming associations and, more recently, they have organized a national association. May we not suppose that our good friends, the manufacturers, looked on for a while and observing how good and pleasant it was for brethren to dwell together in unity, caught the idea and improved it, extending to a complete co-operation by selling out their unprofitable plants to each other and established a unity, placing their business on a more profitable basis?

From Stogies to Perfectos.

Just here it will serve to illustrate my thought by telling an actual occurrence as related to me by a wit-



C. B. CARTER, Secretary-Treasurer.

ness who was present in New York City when the Shovel makers met to fix prices. One of the manufacturers, whose profits had doubtless been small under old methods, was stopping at a cheap hotel, having his mail sent care of the Imperial Hotel and smoking Pittsburgh stogies that cost two for a nickel. During the second meeting he stopped at the Imperial, smoked 10-cent cigars and looked much better satisfied with the world. The third meeting he brought his wife and daughter, stopped at the Waldorf-Astoria and smoked 25-cent cigars and was liberal with them to his friends. You thus see the good fruits of better co-operation, from which I hope we may learn a lesson. It is useless to say that he and his friends could not be persuaded to return to the old paths, when each was fighting single handed against the world.

A Creditor Nation.

As a result of the many aggregations of capital our country has taken her place as the leading exporting nation of the world and swapped sides of the ledger with the balance of trade. The balance of trade in our favor during the last three years has been about $1,500,000,000, and has resulted in bringing home many of our securities, and it is still so large that we hesitate to collect it all, lest we cripple our customers and shut off trade. Hence we shall turn creditor nation and loan what they owe us and collect the interest instead of paying interest, as once we did. Another solution is to buy up their great steamship lines with what they owe and thus solve the question of ocean freights without a subsidy, which has puzzled Congress to handle to the satisfaction of the people. Let us believe that as a preparation for the great work to be accomplished in the twentieth century this great thought of co-operation has been given to the world and has started it on an era of prosperity for which we will search history in vain for a parallel. All this, too, within the history of our association. I do not, of course, claim all this credit for our association—far from it—but all I want to say in this connection is that it comes largely of the spirit of co-operation, of which our association was one of the first exponents and acted as a suggestion to start the work. What I have said will show you the possibilities of good ideas, well developed, and I trust each of you has come to the convention full of mature thought, and that you have something to give each other that shall send us home resolved to excel and that shall better equip us for the great problems that await us.

Some Questions.

Why should ten salesmen, representing the same line, be in the same town in one day? Why should North Carolina ship goods to Virginia and Virginia ship goods to North Carolina, thus wasting a useless freight charge, on the same day? Why should Memphis ship the same kind of goods to Little Rock and Little Rock back to Memphis the same day? Why not let goods go from point of manufacture to nearest point of consumption, with least amount of freight charges? Cannot these questions be solved? The manufacturers are solving them, why not we? We started the thought, they have taken it up and improved it. What we must have is a better unity, a more complete co-operation. I give you the thought—work it out.

Co-operation of Jobbers and Manufacturers.

Our association was the first to regularly invite the manufacturers to our meetings and to take part in some of its discussions. We have not seen cause to regret this. We feel that the jobber and manufacturer should be the best of friends and on the most friendly terms, for each needs the other. The legitimate sphere of the manufacturer is to produce and that of the jobber to distribute. The principles underlying each are different and require a different talent and a different ability. A man may be a good manufacturer, but a poor merchant, or a good merchant and know nothing of how to produce the goods. The best combination is the manufacturer to produce and the jobber to place before the trade. A man by making a specialty of selling and distributing can and should reduce the same to a fine art, and the same will apply to the producing of the goods. The principle underlying each is very different and requires a different talent. The natural and easy road is manufacturer to jobber, thence to retailer and to consumer, and the sooner we recognize this and become reconciled the better for all, and we will thus preserve the underlying thought of all success—unity of action and purpose.

Large Sales and Small Profits.

There has never been a time when our members should take greater interest in association work. The evolutions of the commercial world are rapid and it requires the combined wisdom of all our best talent to forecast the near future and be ready for it. The tendency of trade seems to be to large sales and small profits. This requires that we be thoroughly intelligent about all the details. We cannot longer drift under old time methods, when profits were large enough to take care of all the errors and leaks and leave a good margin. It appears that many of us make our prices based altogether on what our neighbor does, without knowing whether or not we can afford it. To correct this idea our last convention passed a resolution that we would ascertain the cost of handling the several lines of goods, and, judging by the responses our secretary has had, we fear that not many of us have learned how much it costs to sell Nails, Bar Iron, Barbed Wire or the various other lines of goods we handle. How many of us know what it costs to sell Tinware, or Cut-

lery, or Guns and Ammunition? I trust you have been giving this subject some good thought and that during the sessions of our convention you will be prepared to give us the benefit of what you have discovered.

The Two Years Just Past

have been exceptional years in trade. The volume of trade has been large and the profits fair. Whether we are to have a succession of these years we cannot tell. Let us hope that we will. We feel that the settlement of our financial system and the announcement to the world of our adoption of the best standard of money known to the world has had much to do with our prosperity. The intelligent merchant has recognized this all along and has given his influence to this end, and has done much to create the correct ideas along this line. Perhaps this has made possible the formation of the great combinations of capital, resulting in the $1,000,000,000 combination, upon which we at first looked with some fear and which we may yet be taught to look upon with more favor. So far, at least, we have not suffered the loss of any trade that has not returned to us in other ways. Laborers have found employment, and that, too, at increased wages. The agriculturist has found a market for his surplus at better prices, and when taken altogether, some of the fruits have been good. So long as the fruits are good, let us not judge them unkindly. I know that it is a departure from all history and we have no precedents to go by and hence we cannot predict with any degree of certainty the results. This bewilders us and fills us with some trepidations and some fear that there is an element of danger. Instead of standing still and casting unkind epithets, let us apply this doctrine of full co-operation to our businesses and enlarge them and make them also the wonder of the world.

The Recent Brief Panic.

We have recently had another short lesson in the study of panics. This time the contest seemed to be between strong men who were able to lose large amounts without causing failure on their part. No doubt many smaller men lost what they had, but perhaps the heaviest losses will never be reported. In this instance the panic has wrought some good results and has doubtless checked the wild speculation in stocks, which were getting too high, and has driven investment away from the street to seek more legitimate channels, and that, too, without any shock to the commercial world. Since that time loans have been contracted and the reserve increased rapidly.

Unprofitable Prices.

I urge the jobbers of this association to give their loyal support to manufacturers who co-operate with them by giving them their trade and maintaining the full differentials provided. Do not let the thought that you buy cheaper and can distribute cheaper than your competitor lead you to invade his field with prices which are unprofitable. This will lead to demoralization. We feel sure it is to the interest of the manufacturers to encourage this association, and we wish to thank them for what they have done in the past. This association has done much to promote friendly relations between the jobber and the manufacturer, and the benefits derived have been great.

Increasing Wages.

The great strikes which the cities and country are now passing through suggest an inquiry into the prices for labor, and we will find that wages have been greatly increased in the last 20 years and in some cases almost doubled. It was a Frenchman with a genius for statistics who several years ago collected the wage figures of 100 establishments in 22 different industries in the United States for a period of 40 years, from 1850 to 1890, tabulating in the last year the wages of 4,700,000 employees. He found that the average annual earnings of each man were in 1850, $247; 1860, $335; 1870, $375; 1880, $346, and 1890, $484. The figures for 1900 are expected to show a still greater advance. This is a hopeful sign and is encouraging to a large body of our countrymen who do much to produce good business. With the rapid improvement in machinery the productive capacity of our country is greatly improved, and it does not require as long hours of labor and more time is left for mental and spiritual development, which we consider a hopeful sign of the times.

As to the details of what we have done since our last meeting, I will refer you to the secretary's report and to the reports of our several standing committees, which are to follow.

In Memoriam.

For the first time in three years it becomes the sad duty of your president to report the death of any of our members. Since our last meeting we have been called to mourn the loss by death of one of your Executive Committee, W. E. Gibbins, vice-president of W. W. Woodruff & Co., Knoxville, Tenn. He was one of the founders of our association and its first president. He was re-elected and served two terms, and after retiring from the presidency he was elected to the Executive Committee, of which he remained a continuous member to the time of his death. Our association has lost in him one who loved it dearly and whose call to duty was ever obeyed. Harry A. Palmer, vice-president of Palmer Hardware Company, Savannah, Ga., was called next. His summons was rather sudden, while yet in the prime of life. All who had the privilege and pleasure of knowing him will mourn his loss as a faithful and true friend and as a noble man. Cartright Eustis, secretary and treasurer of A. Baldwin & Co., New Orleans, La., was taken next. I regret that I did not have the pleasure of an acquaintance with him. The fourth and last was E. C. Atkins, president of E. C. Atkins & Co., who died full of years and honors. He was widely known as the manufacturer of the well-known Saws which are sold throughout the land and which bear his name. We have a Memorial Committee who will, at the appropriate time, give a more extended notice of these, our lamented brethren.

I desire to thank our secretary, Mr. Carter, for his faithful and untiring labors in the interest of our association and for his loyal and respectful support.

The members of the Executive Committee each have my sincere thanks for their counsel and support. I have at all times found them ready and willing to take up any work that would advance the good of our association.

All the other officers have my thanks for their prompt attention to every call.

The chairman of the Reception Committee, Irby Bennett of the Winchester Repeating Arms Company, made a report in which he outlined the arrangements for the entertainment of the association and their guests.

The president called on R. R. Williams, Hardware Editor of *The Iron Age*, who made a brief address, referring especially to the work and influence of the association, and the opportunities presented for its further usefulness.

The first session was brought to a close by an informal reception of manufacturers, jobbers and visitors.

EXECUTIVE SESSION.

In the afternoon an executive session was held. After the reading of the minutes of the 1900 convention C. B. Carter presented his annual report as secretary-treasurer. The reports of the Transportation, Press, Grievance, Manufacturers', Membership and Executive committees followed. A number of special committees were appointed and communications read. After transacting some miscellaneous business the association adjourned until Wednesday morning.

In the evening a reception and complimentary dance was tendered to the delegates and visitors by E. P. McKissick of the Battery Park Hotel.

WEDNESDAY MORNING SESSION.

This morning's (Wednesday) session was another joint session of jobbers and manufacturers and their representatives. The attendance was large and the session proved a most interesting one. It was devoted

entirely to the reading of papers on timely topics by well-known manufacturers and jobbers, and discussion.

The first paper was read by W. M. Crumley of the Beck & Gregg Hardware Company, Atlanta, Ga., whose subject was "Policy, Potency and Proficiency of the Southern Hardware Jobbers' Association." Mr. Crumley was followed by Robert Garland of the Standard Chain Company, Pittsburgh, whose paper on "Price Guarantees" was as follows:

PRICE GUARANTEES.

We have all had more or less experience with guarantees in their different forms. Principal among these are: Price Guaranteed, Price Guaranteed Against Decline, Price Guaranteed Against Manufacturer's Own Decline.

"Price Guaranteed," "Price Guaranteed Against Decline"—expressed in a few words, but of great significance. I venture to say that in the vocabulary in common use between manufacturer and jobber, there are no sentences that can be placed on an order or on a contract that mean more. A stipulated price on such an order or contract often means nothing; it is a secondary consideration, being something nominal, and not the invoicing or the settling price. From the manufacturer's point of view this broad form of guaranteeing, as it might be called, has its drawbacks, and these are serious. A jobber will make out his order to a certain maker. He may even specify a preferred make or brand of goods, and with "Price guaranteed," or "Price guaranteed against decline" stated thereon, he is in a position where he can apply a lower price received by him, perhaps under peculiar conditions. He may have received a quotation from another manufacturer on a more favorable specification, or it may be the result of irresponsible competition. Goods of cheaper quality or of untried make may be offered, a new Richmond in the manufacturing field (and this is a crop that never fails), perhaps in ignorance of what his goods may cost him, may offer an enticing price for a first order. He will go to the jobber, who, of course, has no compunction in beating him down; and the price so made, the manufacturer of already established goods is asked to meet, nor is he always asked. In a number of cases he first learns that he must meet, or is expected to meet, by having a deduction made on the remittance sheet. It can readily be seen that a number of such deductions, if allowed, will play havoc with the profits of a business. It may not occur to the jobber that should he and his brother jobbers place their orders with such parties there might be difficulty in getting prompt shipment or standard goods, proper credit not being given the manufacturer who in good faith manufactures promptly or ships from his stock on hand a standard article. This, I maintain, is not legitimate trading.

These are only some of the instances that could be cited. It means the returning of checks, the carrying of unpaid balances, and correspondence on both sides, which takes time, and creates worry. Now and then a jobber will be of the opinion that he is being discriminated against, and that his is an isolated case; but not so; where he has a few manufacturers from whom he buys a certain line, each manufacturer will number his customers by thousands, and this returning of checks or carrying of outstanding balances is under such circumstances a matter of almost daily occurrence.

Now, while speaking of these broader forms of guarantees, it is but proper to say that there are some jobbers who will always consider a guarantee of price against the manufacturer's own decline, even if not so specifically stated. But unfortunately these gentlemen are few, and, of course, a jobber should not be blamed for getting all he can.

Another Form of Guarantee.

We now come to another form of guarantee, which is generally expressed: "Price guaranteed against manufacturer's own decline." The words "up to date of shipment" are sometimes added to this form, and this is where it becomes susceptible to various meanings. The manufacturer will contend that his lowest price on or at date of shipment should rule. Some jobbers, however, go further and will ask for the benefit of the lowest price that ruled between the date of the placing of the order and the date of shipment. As a consequence we find guarantees worded "Price guaranteed at (instead of up to) date of shipment," a change in prepositions making them different propositions.

Broadly guaranteeing up to date of shipment on a contract or order contemplating, say, six months' delivery is, as can readily be seen, a serious matter to the manufacturer, especially on a fluctuating market. He is then in a position, according to some authorities, where on such contracts all goods are sold at lowest price ruling during the period of contract, while as a matter of fact, the price at time contract was placed and when contract was completed might be very much higher. The fact is that, generally speaking, this matter of guaranteeing prices opens a wide door, and if it were done away with entirely our trade relations would be smoother, more straightforward and more business-like. The manufacturer of Hardware staples only hears of price guarantees when he sells to the jobber. In other words, he himself finds it impossible to make his purchases in this manner. In England every order is a contract, just as "every tub stands on its own bottom." The British manufacturer would not dream of guaranteeing prices any more than he would allow an order once placed to be canceled. With our natural resources, improved machinery and up to date facilities we can outdistance England in the manufacturing field, yet in some points of trading she is still our teacher, and her manufacturers would hold up their hands in holy horror if it was even intimated that they should guarantee their prices. This, it seems to me, is an instance where some of us have been progressive in the wrong direction, having been overcome by the blandishments of our friend the jobber.

If the Manufacturer of Staple Goods

could on his part purchase his Billets, Rods or Wire, as the case may be, with price guaranteed, it would then be an easy matter to make guaranteeing general. But such is not the case. The buyer of raw material is not privileged to deduct a dollar a ton off the face of an invoice by claiming that "another manufacturer has offered this price," or "this is made to meet one of your competitors." These phrases will appeal to you as being inventions of the jobber. They do not emanate from the manufacturer, but come to him. No, the buyer of raw material is not even allowed to cancel an order on a declining market, being held strictly to his contract to take out the last pound, no matter how much the market is off. If you did not have the canceling privilege you would consider yourselves much abused, and here comes the question, "Do you on your part give your customers in the retail trade the benefit of a guarantee against your brother jobbers?" "What is sauce for the goose is sauce for the gander." When it comes to price guarantees, the manufacturers allowing same have evidently been the geese. Why should you not purchase your goods at a fixed price and sell at a fixed price? We purchase our raw material, our fuel and our labor all at fixed prices, and expect to make a fair margin of profit thereon. Just as the price on our raw material, fuel and labor is fixed, so should our selling price be fixed, and this rule should obtain in all trading.

A Compromise Suggested

Like all questions, however, this has its two sides. On one side you will find arrayed the manufacturers, or the sellers; on the other the jobbers, or the buyers, each looking at it from his own point of view, one considering guaranteeing as altogether obnoxious, and the other as something necessary. We should, therefore, strike a happy medium, and reach such a compromise as will be mutually satisfactory. It seems to me, therefore, that the manufacturer, if he give anything, should not give more than a guarantee that at date of shipment if his price be lower, the jobber will get the benefit of such lower price. Also giving him the privilege of timely cancellation of his order, if such order be for staple

goods. If he has been quoted a lower price than the manufacturer is willing to give, he has the privilege of cancellation. More than this should not be given on one side, nor should more be expected on the other, and if questions such as these, which might be called "points of variance" between the manufacturer and jobber, were solved in a mutually satisfactory way through the medium of our Hardware jobbers' associations, and were then observed to the letter, much would be gained in the promotion of harmony in our business of trading one with the other.

Mr. Garland's paper was followed by an interesting discussion, in which Charles H. Ireland of Odell Hardware Company, Greensboro, N. C.; W. M. Crumley of the Beck & Gregg Hardware Company, Atlanta, Ga.; W. H. Kettig of Milner & Kettig Company, Birmingham, Ala., and Mr. Garland participated.

Papers followed on "The South Socially and Commercially," by Geo. W. Lee of Eberhard Mfg. Company, Cleveland, Ohio, and "Classified Lists *vs.* Quantity Discounts," by Thos. W. Fritts of Tom Fritts Hardware Company, Chattanooga, Tenn.

The next paper, entitled "The Future of the Trusts," was presented by James P. Kelly, president of the Kelly Axe Mfg. Company, Alexandria, Ind., and was as follows:

THE FUTURE OF THE TRUSTS.

A great preacher once said that his best sermons took 15 minutes to deliver, his medium sermons about 30 minutes, and his worst ones twice as long. Duly mindful of this, in discussing the question of trusts and their future, I will be very brief and mention but one aspect of the case.

This trust question is a very large one. It is a condition and not a theory. When you Hardware merchants walk through your stores and realize the number of articles which you have to buy without any option on your part as to prices and terms, the situation may at first seem serious and the future very dubious indeed. But, like nearly every other question in this world, there are two sides to it. As a practical manufacturer, it has occurred to me to call your attention to one aspect of the question which may afford some comfort to those who are disposed to take a pessimistic view of the future situation.

What is a Trust?

In the first place, What is a trust? In one sense a trust may be defined as a consolidation of factories under one management, for the purpose of controlling not only the product of these factories, but generally to control the entire market for the goods. Now these different factories all once had a separate, individual existence. Each one was an entity of itself and almost without exception was built up from a small beginning. I cannot in the whole country recall a single large, successful factory that started large. Like nearly everything else, it had to start small, frequently had to fight for its very existence, and only by the inexorable law of the survival of the fittest is it living to-day.

Now what enabled this factory to grow from a small beginning and become successful? Simply the personal, unremitting toil of some one man. This one man, through his close application to his work, through that concentration on his one object in life, caused the small plant to grow and expand. Working by day and dreaming by night on each detail of his business, it was impossible for competition to thwart him, and at last he finds himself at the head of a large concern able to hold his own against all comers. This may be fairly considered as the average story of the factories that now make up the existing trusts.

On the other hand, there are some factories whose history has been more brilliant than that of the average. Some of these concerns, built up and managed by men of exceptional ability, and perhaps favored by natural advantages, far surpass their rivals in the race for the trade and thus occupy a most enviable position.

We now come to the period when so many of these factories surrender their individual existence to become merged into trusts. We need not go far to see the reason of this. You Hardware jobbers know perhaps better than any men in the country what competition between manufacturers means. You also know well what competition between yourselves means. This very association is in existence to-day as a kind of safeguard against too much of such competition.

The manufacturers at first tried similar associations, but they did not seem to succeed. The fact is, the competition between manufacturers assumes forms that sometimes become so intolerable that when the promoter appears with his persuasive tale of vast profits through pools and consolidations he finds many ready listeners, and the result is the trusts.

Management of Trusts.

Now the question is, What will be their future? Will they "sink or swim—survive or perish?" And the answer, it seems to me, depends upon their fulfillment or non-fulfillment of at least three conditions. The first condition is that the trust itself be managed with the same ability that its individual factories were managed. Now as to management, it will be admitted that the trust is greatly handicapped. The factories as a general thing lose the services of the men who built them up. They also lose the services of able managers and superintendents, who are thrown out by the consolidation. Do these men meekly lie down and starve or let their families starve? Not much. Before the new trust is fairly started these men are pouring into the ears of eagerly listening capitalists their statements as to how a well managed independent concern can compete with the trust.

A prominent Treasury official stated in a public interview a few weeks since that money was now a plethora, and that 4 per cent. was all that it was worth, and that it would probably soon be cheaper.

Therefore, when men of real ability lay their plans before capitalists who are anxious to make more than 4 per cent. on their money, it is wrong to assume that the fiercest competition will not soon spring up from these men, who are not only desirous of making a living but also of retaliating upon the concerns that threw them out, if the mistake is made of doing so.

In any event, the factory management goes to some other than the man who built up the business. No matter how capable the new manager may be, it is not in human nature that he should give the same earnest thought and work to his position as did the man who built up the business. Even if he were willing to do so, he is handicapped by the superior authority over him, which is unfortunately in many cases located in some distant city, hundreds or perhaps thousands of miles away.

This distant authority is, on the other hand, equally handicapped in the management of the factory by its distance, just as you would be, Mr. Moore, if you had an office in New Orleans, and managed your Birmingham business from New Orleans. Therefore it is evident that in order for the trust to be managed with the same ability that built up the individual factories a very high order of talent is absolutely necessary.

Genius has been defined as a capacity for hard and conscientious work, and nothing short of genius itself can fill the bill. Unfortunately for some trusts, it seems that their managers have adopted the idea that their position means that they are to live in New York and play poker at night and play Wall street in the day time. I think you will all agree with me that such management can have but one result.

A Distinction in Trusts.

On the other hand, a distinction should be made between the trusts which produce machine made goods, such as Rails, Nails and Wire, as against the trusts which produce fine hand made goods, such as Cutlery, Tools, &c.

With the machine made goods it may be possible to manage the trust with apparent looseness and yet make money, because the goods, being almost entirely pro-

duced by machinery, can be automatically made and do not suffer the deterioration in quality which hand made goods invariably suffer the moment the stringent care of the old personal management is relaxed.

I repeat that this may be so, although it is doubtful and I do not know it, but of one thing I am absolutely certain, and that is that no trust that produces hand made goods can possibly succeed against modern competition unless the same stringent inspection of the quality of the goods is carried out. The same conscientious, close management in the factories, the same care for the personal welfare of the employees that characterized the old days, is observed.

Right here is where an element of danger lies for such a trust. In goods where the high quality of the work is everything, and where skilled hand work is essential, there is a constant tendency toward deterioration in quality unless an equally constant stimulus is applied to keep it up.

This stimulus must come from the highest in authority and go down the ranks. The very moment that the slightest relaxation from headquarters takes place it is felt throughout the entire system, and the inevitable result is a let up in the quality and a loss of trade, and consequently an opportunity for an independent competitor to get in.

Protection of Jobbers.

The second condition is that the jobbing distributers shall be properly protected. The trust making goods that are usually distributed by jobbers, that attempts to ignore their interests, is just as sure of failure as that the future will come. In no other country is the jobbing business so highly developed as in this. With enormous capital invested, with expert managers at the heads of the many great houses in all parts of this vast country, it needed only one thing to perfect this wonderful system of distributing goods, and that was the formation of the Hardware associations. They bind together the great houses in a "community of interests" that makes it an act of folly for any trust to antagonize them. This is such a self evident proposition that it needs not be dwelt upon.

Consumer Must Be Benefited.

The third condition is that the consumer shall be benefited and not burdened by the formation of the trust. It has always seemed passing strange to me that these modern trusts have not taken heed to the policy which seems to have always actuated the brilliant management of the Standard Oil Company in this respect. So far as I know this policy has always been to keep down the cost of goods to the consumer. Their profits seem to have been made in other directions than exacting increased taxes from the consumer. However some of their methods may be criticised, there can be no question of the genius of the management in this respect.

It is extremely inconsistent, to say the least of it, for a number of concerns to consolidate into one, claiming that they can greatly save expenses by doing so, and then at the very first move to advance the price of their goods to the consumer. This is so palpably wrong and approaches so nearly to attempting coercion and tyranny that the utmost resentment is caused by it. If there is one thing fully developed in the nature of the people of this country it is that of being utterly opposed to coercion in any form.

The great P. T. Barnum once said that the American people loved to be humbugged, but this very element in our national character, that enjoys a joke on ourselves, is the best proof in the world that we would resent to the utmost any attempt to unduly tax us, and when the trusts, in the face of decreased cost of production, attempt to put on the screws and try to tax us, it is hardly necessary to say that the same spirit which resented a similar attempt by Great Britain when we were a small and feeble colony is still alive to-day, but in a thousandfold stronger form.

Therefore I would say in conclusion that the future of trusts depends upon their management, and upon their treatment of the consumer.

If the management of the trust relies upon its fancied power and ignores the needs of the factories, and while "clothed in a little brief authority" attempts to tax the consumer instead of benefiting him, then that trust is doomed, just as surely as any other attempt at dictation and unjust taxation is doomed in this great country of ours.

But if the management is able and the cost of the goods to the consumer is steadily reduced, such a trust will undoubtedly win the support of the people and be not only a blessing to the country, but also a gold mine to its stockholders.

W. T. Shannon of the American Sheet Steel Company followed Mr. Kelly with a paper on "Unity of Action on Prices and Terms," after which T. W. Gathright of May & Thomas Hardware Company, Birmingham, Ala., considered the "Differentials Between Jobbers and Retailers" in the following address:

DIFFERENTIALS BETWEEN JOBBERS AND RETAILERS.

By what difference should exist between jobber and retailer I understand is meant what margin of profit should exist between the two.

I do not think there is any particular standard of value by which this difference could be measured, for the reason that there are some lines of goods that will admit of a larger margin of profit to both the jobber and retailer than others, and think the class of goods should determine what differential should exist.

In considering this question there are, as I think, three parties interested—namely, the manufacturer, jobber and retailer, each of whom is equally concerned.

The manufacturer in making his price to the jobber should not be too much inclined to take more than the lion's share of the profit, for the reason that "the laborer is worthy of his hire," and should first consider at what price his particular line of goods should go to the consumer, then take into consideration the expense of doing a retail business, and fix a price for the jobber that would allow both the jobber and retailer a fair margin for expenses and interest on capital invested, in addition to what they are entitled to for their services.

When this has been done and the goods are in the hands of the jobber, then he should not expect to grow rich in a day by taking all there is left, but should make such a price as would bring a fair return for his services and capital.

There is not the least doubt in the world but what the manufacturer, jobber and retailer are equally dependent on each other. The manufacturer because the expense would be entirely too great to justify him in visiting the retailer to supply him with what few goods he would want in his particular line, while the jobber can do so with his large line and do a sufficient volume of business to justify him in doing so.

For illustration, we will say Mr. A manufactures Axes and puts them on the market at a profit of $1 per dozen. The average retailer will not buy over ten dozen at a time, so you will see he has made only $10 for his day's work, while the expenses and salary of the salesman alone would amount to equally as much, if not more; while he could go to the jobber and sell his 800, instead of ten, dozen with the same expense, and it therefore follows that the jobber is an absolute necessity to the manufacturer.

The jobber is equally as dependent on the retailer because it is to and through him that he expects to sell his goods, and if the retailer is eliminated the jobber becomes a thing of the past.

It therefore follows that the three must dwell together in unity and good fellowship, each respecting the interest of the other, so that if either one or the other should fall by the wayside, we could join the illustrious poet in saying:

You may break, you may shatter,
The vase if you will,
But the scent of the flowers
Will remain round it still.

"Combinations" was the topic assigned to C. M. Fouche of the Crucible Steel Company of America, who addressed the convention as follows:

COMBINATIONS.

I am well aware of the fact that I shall invite adverse criticism from many members of this association when I assert that combinations are the legitimate offspring of the jobbers and large buyers of this country. If this assertion is susceptible of proof beyond peradventure, then it is equally true that this child of their loins should be fostered and preserved by them. Up to the beginning of our Civil War I can find no record of combinations for the purpose of maintaining or regulating prices, and as there was at that time no necessity for their existence it is fair to assume that there were none.

Conditions Forty Years Ago.

Prior to 1860-70 the manufacturers of this country could invest their capital in various enterprises with a reasonable assurance of obtaining a fair return upon their investments. The dealer could in turn buy the products of the manufacturer with a feeling of absolute certainty that he would be able to realize a fair margin of profit upon his purchases. Failures were rare, except during a few periods of financial panic, and such as did occur were caused by mismanagement, or want of business capacity. The manufacturer before deciding to embark his capital in an industrial enterprise would ascertain first whether there would be a fair demand for his products, and second whether they could be disposed of for reasonable profit. The jobber would invariably base his prices upon those made to him by the manufacturer, add a fair percentage of profit and sell his goods with less effort and with greater satisfaction to the buyer and consumer than at present.

In More Recent Years

there has been a marked change in these conditions, with the result that both manufacturers and jobbers have become little less than speculators, and there has been about as much certainty of profit in buying Louisiana lottery tickets or cotton futures as there has been in the purchase of an ordinary stock of goods by the merchant or the usual supply of raw material by the manufacturer.

I am sure that members of this association will agree with me that this change in our business conditions has been neither beneficial nor profitable, and that any system which will reduce buying and selling to a more safe and certain basis should demand and receive the cordial support and encouragement of every business man in this country. I affirm that this change in conditions has been brought about largely, if not entirely, by buyers who are usually ignorant of the actual cost of production and who are unwilling to allow the manufacturers a reasonable profit over cost. These buyers have been materially assisted by overzealous salesmen who are ever ready to sacrifice profit in order to secure business, and the result of their combined efforts has been the combination and the trust.

The Buyer the Parent of the Combination.

It has struck me that the original cause of the jobber's earnest efforts to lower prices has generally been a desire on his part to purchase goods cheaper than his competitors, and that in his endeavor to accomplish this end he frequently seems utterly regardless of the fact that he may be forcing the manufacturer to sell at an actual loss. This constant and never ceasing pressure for lower prices has finally resulted in forcing many manufacturers to the wall and the survivors into agreements to maintain prices for self preservation. I therefore assert without fear of successful contradiction that the buyer is the true parent of the combination.

Demoralizing "Special" Prices.

The unfortunate result of these efforts on the part of the jobber to take from the manufacturer his last vestige of profit in his endeavor to purchase goods at lower prices than his competitor is found in the fact that he seldom, if ever, accomplishes his purpose, for it is a rare salesman who will confine these "special" prices to the original beneficiary. He feels that it would be both unjust and unfair to his other customers to place them at a disadvantage with others in selling his goods, and the usual result follows that his *special* price soon becomes a *regular* one. This constant hammering of prices also frequently brings about a feeling of antagonism between buyer and seller where only the best of feeling and true community of interest should exist. My experience has been that the average buyer bases his ideas of cost largely upon the prices he has been able to extort from the manufacturer from time to time, and this is anything but a safe guide, as makers of such staple articles as Iron, Steel, Nails, Wire, Pony and Boy Dixie Plows, Georgia Stocks and Cotton Planters can easily testify.

If there was any real benefit to be derived from this unreasonable demand for lower prices there might be some excuse for it; but there is absolutely none. The jobber rarely, if ever, secures any better profit from these "special" prices, for he invariably "passes it on" to his customer, and he in turn to the consumer, who has neither asked for nor expected the concession. The manufacturer has, therefore, been forced to surrender his profit without having benefited his customer.

The combination of business interests for the purpose of maintaining profitable prices only came into existence when it became necessary for self preservation, and it is therefore extremely probable that it is here to stay. The world has been astounded by the enormous sums which have recently been invested in various industrial and carrying enterprises, and the character and standing of the men who have embarked the bulk of their fortunes in these companies give us a reasonable guarantee of their stability for both the present and the future. The failure of one or more of these colossal combinations would cause a financial convulsion such as the world has seldom seen, and the effects would be so far reaching and general as to be acutely felt throughout the four quarters of the globe.

The Interests of these Industrial Enterprises

are so closely interwoven with those of the great transportation lines as to make them almost identical, and anything which injuriously affects the one must of necessity seriously affect the other. It is therefore manifestly to the interest of each to foster and build up the other. Those who are at the head of these gigantic companies are men who have fully demonstrated their ability to manage large affairs successfully, and it is reasonable to assume that they will pursue such a course as will popularize the new concerns with the masses, and add to the general prosperity of the country.

Stability of Prices.

They are well aware that they can only hope to prosper when the country generally is prosperous. Their policy will therefore unquestionably be such as to render prices stable and to secure the good will and support of the jobber and dealer, as it is only through them that they can hope to dispose of their products. Experience has clearly proven that violent fluctuations in prices are alike injurious to both manufacturers and jobbers, and that short periods of inflated prices are invariably followed by long periods of corresponding depression and loss. We can therefore reasonably look for a considerable period of stable prices and fair profits in business for the future. It will be left to the jobbers in many cases to determine whether it is to his best interest to patronize the large combinations and thus aid them in maintaining stable and profitable prices, or encourage outside competition, which almost invariably results in uncertainty as to prices, and a corresponding uncertainty as to profits.

While I do not anticipate or predict a "business millennium" under the new order of things, I am firmly convinced that we are just entering upon a period of the greatest and most general business prosperity that this country has even known, and that the future will prove that there is a true and lasting "community of interest" between the combinations of manufacturers and those older and more powerful combinations known as the National and Southern Hardware Jobbers' Associations.

The next paper on the programme was "Southern Trade and Expansion," Geo. H. Harper of Clendenin Bros., Baltimore, making the address, as follows:

SOUTHERN TRADE AND EXPANSION.

You have selected a very beautiful spot to hold your convention this year, and the manufacturers and their representatives, whom you invite, I feel sure accept the invitation with much pleasure. They all recognize the importance of these meetings.

Your association, I am told, started with some 19 or 20 members, and at this meeting you have a membership of 75. You are to be congratulated upon this splendid showing. There is one little thing, while on this part of the subject, that I would like to speak of. It is this: The manufacturers and boards of trade in some of our large cities have recognized the personal makeup and strength of your association, and you have been invited to meet in some of these places. Cleveland manufacturers this year were very desirous of having you meet in their city. But, with one exception, you have stuck close to places in your territory. I am sure that, should you decide in the future to accept an invitation to some of these large manufacturing cities, you will have just as large an attendance and I think a very profitable meeting. It will be a help to you to see how some of the large manufacturing plants turn out their products and the systems used in preparing your orders for shipment. You would, I believe, find it interesting and the knowledge there gained of practical value. This is one way of applying expansion; try it on. But what I have in mind especially is your trade.

Growth of Southern Jobbing Business.

The growth of the South has been phenomenal, and the growth of your business is due entirely to the growth of your section. It seems that some manufacturers in the East and North have also recognized this, and have sent their representatives outside of their regular field seeking trade where they have not heretofore had it, and resorting to methods of selling goods which are at least subject to criticism. No manufacturer can successfully expand in that direction. The large manufacturers will tell you that the jobber is a necessity, here to stay, and bound to be considered at all times. While, at times, he has ample reasons to kick, yet he is not always kicking. He is the manufacturer's good friend and should be protected. And right here, along this line, there is a question I know to which you are giving some thought, and that is, "What protection are the jobbers to receive at the hands of these great combinations?" I asked an official of one of these big corporations what were his ideas on this subject. He said, in part, as follows:

"I will tell you that, had we not consolidated, it would have been simply impossible for us to establish or maintain the difference in prices now in effect between the retailers and the jobbers. Heretofore, when our salesmen would go to a fairly good buyer in a city and quote prices, it was generally at the jobbing prices, particularly if they bought in case lots. This was done because our competitors did the same thing. A consolidation of a number of manufacturers into a large corporation gives the opportunity to maintain the prices to the different grades of buyers, which was not possible in the old plan. The large corporations will put this into effect and operation as long as the jobber shows a disposition to co-operate with the manufacturers and support them. It is evident that, by working with the manufacturer, the quality of the goods will gradually improve and the profits can be kept up on a better basis than was possible when there were a number of manufacturers in the field, and all of them competing for the jobbing and retail trade."

The Progress of Trade.

Only a few years ago the Southern jobber had to send his orders to the Eastern and Northern manufacturer for nearly every article he wanted. This is not the case to-day. Instead of sending from 1000 to 2000 miles, he is buying some of these almost at his own door. The bulk of the manufacturing is carried on in the North, but this does not imply that it will or always should be so. I sincerely believe that, in the course of the next few years, you will see in the South manufacturers of nearly every kind of article that is now being made by makers in other sections. It is no secret that skilled labor is not as plentiful in the South as it might be, in view of the opportunities which are afforded for its employment. In due course, however, as manufacturing plants continue to increase, there will be larger additions to its industrial population.

In 1866 there was not a cotton mill in the South. This industry has since grown by leaps and jumps. In this, during the last five years, the North has stood still; in the South it has increased 86 per cent.

In the year 1890 there were 1,550,000 spindles and 36,300 looms.

In the year 1896 there were 2,000,000 spindles and 70,000 looms.

In the year 1900 there were 4,700,000 spindles and 110,000 looms.

The Cotton Makers of the South

ought to be the best kind of commercial expansionists, especially in the extension of our trade abroad—and why? I will quote a few words from Rounsevelle Wildman, the late United States Consul-General at Hong Kong:

"If properly placed before the Chinese, American cotton goods will obtain the same foothold in Southern China that they have in Northern. The present importations are not nearly sufficient to meet the requirements. It must be borne in mind that the Chinese never wear wool, not even in the depth of winter, but clothe themselves in cotton all the year around. Their bed clothes, umbrellas, and, in many cases, boat sails, are made of cotton, and the consumption is practically unlimited if made in accordance with native requirements."

Railroad Construction.

Nothing more strikingly illustrates the progress of the South than its railroad construction. In 15 years 35,000 miles were built, and thousands upon thousands of dollars expended upon them. In 15 years the production of pig iron increased from 397,000 tons to 1,900,000 tons, and in the same time the coal production increased fivefold. It is true that a good deal of the capital for the Southern enterprises comes from the North, but the greater part represents the savings of the Southern people themselves.

History does not furnish any parallel to this recovery of a people from absolute ruin.

The Southern manufacturers, the Southern jobbers and the Southern people generally entered the new century in a splendid and healthy state. That section of this great and growing country is becoming a factor of great and permanent importance in the equation of the industrial future of the United States, and its prosperity is a sign of national health, in which all classes find cause for congratulation.

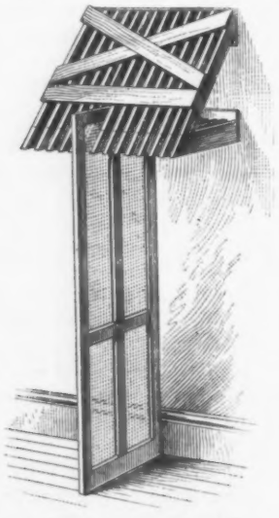
The closing paper of this session was read by A. P. Duncan of McLendon, Duncan & Co., Waco, Texas, whose subject was "The Traveling Man—a Welcome Visitor?"

WILLIAM VOGEL & BROS.

WILLIAM VOGEL & BROS., Brooklyn, N. Y., have sold to the American Can Company that portion of their business relating to the manufacture and sale of Tin Cans, Boxes and Packages. Without any other change their business, which was established in 1863, will continue under the same name and at the same location as heretofore, manufacturing all kinds of special seamless and pieced articles of sheet metal, to which their exclusive attention will now be devoted. They refer to their increased facilities as enabling them to give perfect satisfaction to their patrons. Their plant now includes a die and machine shop, an electro plating and finishing shop and a lithographing establishment, all of which together with their press and stamping rooms are referred to as fitted with the most approved modern machinery.

ELEVATED SCREEN DOOR RACK.

THE Screen Door rack shown in the accompanying illustration is used for display purposes by C. H. Casey of Jordan, Minn., and is designed to hold a sample of each size and style of Door carried in stock. The rack is made of 1 x 3 inch lumber, spaced 1½ inches between each strip, and is bolted to the wall 6 feet 3 inches from the floor, thus permitting 7-foot Doors to pass under the brace. A similar rack, made on a larger scale, is used in the basement, each compartment holding six Doors. The Doors are uncrated when put in the rack, and when a sample is sold from the rack in the store it is replaced



Elevated Screen Door Rack.

from the rack down stairs. The racks have given good satisfaction, being compact, holding doors in an upright position and preventing the doors being scratched. All doors are easy of access, while the rack is neat in appearance.

SIDNEY SHEPARD & CO.

THE enameling works of Sidney Shepard & Co., Buffalo, N. Y., noticed in these columns not long since, are rapidly approaching completion, and plans are now complete and contracts will be let within a week for extensive warehouse and factory buildings adjacent thereto. The firm expect to remove their entire works to the new location, releasing the present works, which are near the center of the city, for warehouse purposes. To extend their already large business in Cans and Boxes they are arranging to add machinery for the manufacture of Square Syrup Cans, Varnish Cans, Jacket Oil Cans, also a lithographing department for the manufacture of Lithographed Cans and Boxes.

BAXTER PORTABLE OUTFITS.

W. E. BAXTER, Frankfort, Ky., has issued a catalogue relating to his Baxter Portable Outfits for camp, boat, tent or house, for sportsmen, tourists, miners, prospectors, &c. Besides the regular outfit, consisting of 60 pieces for six persons packed in stove, 10 x 12 x 18 inches in dimensions, the catalogue calls attention to Convertible Table Kit Case, Folding Tripods, Automatic Seats, Gold Medal and Government Standard Camp Folding Beds, &c. A loose circular describes the Blue Grass Kentucky Reel.

C. H. Casey, Jordan, Minn., has just moved into his new store, which has been attractively fitted up in modern style, with hard wood floor and shelving, steel ceiling, arc lights, elevator, &c. The new store, with warehouse attached, gives Mr. Casey about 10,000 square feet of floor space.

B. H. Derrick & Co. have succeeded Flewellyn Bros. in the Heavy Hardware and Agricultural Implement business in West, Texas.

CONTENTS.

SHOW WINDOW DISPLAY.

This Department is to give information in regard to the use which may advantageously be made of show windows of Hardware stores, with practical suggestions in regard to the arrangement and display of goods and other methods of attracting business.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

A NEW LOCOMOTIVE.

A locomotive of new and unique design was recently constructed by Walter E. Williams, San Diego, Cal., for his show window. It proved a strong drawing card, and was the recipient of much attention, being finally bought by an admirer, who took it into Mexico and Central America to show the "greasers" a "Yankee trick."

The locomotive was built up on a bed plate made of 1-inch board, 9 inches wide and 30 inches long, painted black. On this was placed the boiler, consisting of a joint of 7-inch stove pipe 24 inches long. The smoke stack consisted of a 1-Quart Tin Fruit Can, capped with a Nickel Cuspidor. A small Tin Pan served as the headlight. The bell was an Agate Funnel held in place by a frame made of Sheet Iron Strips. A small Stove Knob represented the clapper. The steam dome was made of a large Tea Canister, surmounted with a large Nickel Stove Knob, serving as the whistle. Two Drip Pans, fastened top to top with strips of Sheet Iron around Wire at corners of Pans, and standing on end, the bottoms facing front and back, formed the cab of the locomotive. The bell cord was made of a small Dog Chain. The cylinders consisted of Japanned Flour Dredge Boxes. Tin Pans served as wheels, a larger size being used for the driving wheels than for the pilot truck. These wheels were fastened to the wooden bed piece. The driving and connecting rods were made of strips of Tin. A Dust Pan served as the cowcatcher.

The tender was constructed with a bed piece of 1-inch board, 9 inches wide and 12 inches long, also painted black. To this two wheels were fastened on each side, the wheels being made of small Tin Pans, like those on the forward truck of the engine. Two Roasting Pans were fastened together, top to top. The bottom of one was laid on the bed board. This completed the tender. The wording used on the tender just described was: "San Diego & Salt Lake Railroad. No. 1."

DISPLAY PANELS FOR SIDES OF WINDOWS.

The side walls of windows are, as a general rule, the part of the window most neglected by the window dresser. Many dealers who devote much attention to the floor and the back of the show window leave the side wall perfectly bare.

While a display on the side wall of the show window does not generally attract the eye of the passerby as quickly as a display on the window floor, it serves well to hold the attention of the person looking into the window. These displays are of special value in windows with open backs, for they can be seen both from the street and from the store. Some merchants with uninclosed windows consider the side wall window displays of nearly equal worth to those on the floor of the window as means of selling goods, for they frequently sell goods to people within the store.

Goods of the finer quality, such as Tools, Cutlery, Instruments, &c., can be shown on panels or in glass covered cases on the sides of windows to exceptional advantage. The accompanying illustrations, sent by G. F. Maxfield, with De Wolf & Vincent, New Bedford, Mass., show panels in the windows of that store. Fig. 1 is composed entirely of Tools, and Fig. 2 of Cutlery. It will be noticed that goods of but one class are shown on each board, and that particularly good taste has been exhibited in the designs. The panels are first covered, it is explained, smoothly with cloth of a suitable plain color, black, red and dark olive green being preferred. Then an attractive geometrical design is made of Tools,

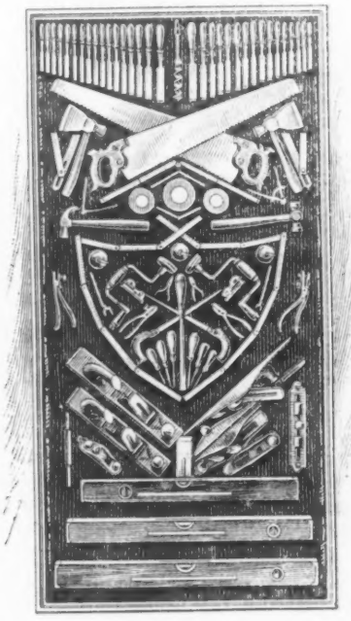


Fig. 1.—Panel of Tools.

or whatever it is desired to show. Regularity of design is essential to a good display. The articles are held on

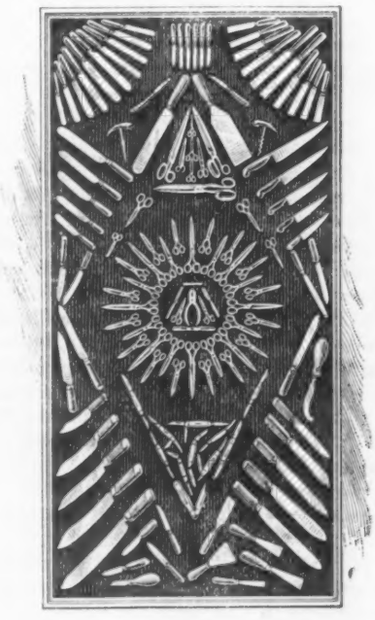


Fig. 2.—Panel of Cutlery.

by screw hooks, &c., so that they may be easily removed if so desired.

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EXTRACTS FROM LETTERS.

I.

Noting your mention in *The Iron Age* of the sign, "Cast Iron Sinks," has brought to mind a sign shown by an Eastern merchant in another line, which reads:

SHIRTS RETAILED.

People talked about this sign, and I believe it brought some business. It would probably have been a better trade winner had it been written:

SHIRTS RETAILED
AT WHOLESALE PRICES.

The pun is retained in this form and the additional impression of cheapness in price—not quality—is given. Perhaps some ingenious Hardware merchant may be able to apply this suggestion to appropriate wording.

II.

We do not know what articles give us the best returns when shown in our windows. Several have proven themselves particularly good. When we put in a bathroom display, we find that is good; when we put in a Range display, we find that is good; when we put in Parlor and Oil Stoves, making the heating display, we find that to be good; then sometimes we put in a lot of Tools, and we have found that to be good also. So you see it is hard for us to designate anything particularly ahead of the other.

III.

It is our aim to brush up and change our window display each week as the season changes, always moving out some goods each time and putting in front new or special articles, thereby not changing all at one time.

IV.

We have placed a Tile Lined Refrigerator in our window, throwing the door open at such an angle that the white tile attracts the attention of the people as they pass by. This has caused a number of people to stop and look and make inquiries, and anything else would have, at the proper season, attracted just as much attention had it been a little odd or unusual in its general makeup. Something new or strange is always the best as an attraction.

CHARLES MILLAR & SON COMPANY'S CATALOGUE.

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EXTRACTS FROM LETTERS.

I.

Noting your mention in *The Iron Age* of the sign, "Cast Iron Sinks," has brought to mind a sign shown by an Eastern merchant in another line, which reads:

SHIRTS RETAILED.

People talked about this sign, and I believe it brought some business. It would probably have been a better trade winner had it been written:

SHIRTS RETAILED
AT WHOLESALE PRICES.

The pun is retained in this form and the additional impression of cheapness in price—not quality—is given. Perhaps some ingenious Hardware merchant may be able to apply this suggestion to appropriate wording.

II.

We do not know what articles give us the best returns when shown in our windows. Several have proven themselves particularly good. When we put in a bathroom display, we find that is good; when we put in a Range display, we find that is good; when we put in Parlor and Oil Stoves, making the heating display, we find that to be good; then sometimes we put in a lot of Tools, and we have found that to be good also. So you see it is hard for us to designate anything particularly ahead of the other.

III.

It is our aim to brush up and change our window display each week as the season changes, always moving out some goods each time and putting in front new or special articles, thereby not changing all at one time.

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Graphite Cycle Lubricants and Dixon's Graphitoleo for especially fine bearing parts occupy the next few pages, followed by Dixon's Silica-Graphite Paint for metal work of all kinds, furnished in olive green, black, dark red and slate colors. Among other goods included are Dixon's Graphite Pipe Joint Compound and Belt Dressing, Dixon's Carburet of Iron Stove Polish and Stove Cement for the repairing of broken stove or range linings. A number of pages are devoted to Dixon's American Graphite Pencils, the catalogue closing with Slate Pencils in wood and Felt Erasive Rubbers.

REDUCED PASSENGER RATES TO NEW YORK.

THE Merchants' Association of New York have been notified by the Trunk Line Association that their application for reduced rates for buyers who desire to come to New York during what is known as the fall buying season has been granted.

The conceded rates apply to the territory from the New England boundary line, west to Buffalo, Pittsburgh and Wheeling, W. Va., being one fare and one-third for the round trip, subject to the conditions under which similar rates have been granted in the past.

The territory between Buffalo and Pittsburgh, west to the Mississippi River and south to the Ohio River, is under the jurisdiction of the Central Passenger Association. Now that the rates have been granted by the initial lines leading into New York, a similar application will be made to the Central Passenger Association, whose headquarters are at Chicago.

Applications have already been made to the other railroad associations of the country, known as the New England Passenger Association, covering the New England territory; the Southeastern Passenger Association, covering the territory east of the Mississippi and south of the Ohio rivers; the Southwestern Passenger Association, having jurisdiction over Texas, Indian Territory and Oklahoma, and the Western Passenger Association, controlling traffic organizations west of Chicago and northwest of St. Louis.

PRICE-LISTS, CIRCULARS, &c.

THE MCCRAY REFRIGERATOR & COLD STORAGE COMPANY, Kendalville, Ind., and 55 Wabash avenue, Chicago: Catalogue No. 36 gives a description of the company's lines which use the McCray patent system of refrigeration. The walls of these lines of Refrigerators are well insulated with mineral wool and special Refrigerator paper. These are all lined with either white encaustic tile or odorless wood, zinc not being used. The catalogue contains 31 illustrations of the company's goods, comprising both tile lined and wood lined Refrigerators. It also contains an illustration and description of their modern residence Refrigerator, which is made to order in any size, and is iced from the outside.

STOWELL MFG. COMPANY, 114-134 Culver avenue, Jersey City, N. J.: A little pamphlet setting forth the merits of a "cheap, durable and acid proof roofing for mills, factories, farm buildings, foundries, railroad buildings, warehouses, stables, &c." Illustrations are given showing how the company's Ready Graveled Asphalt Roofing is made, and directions are presented for laying Gravel Asphalt and Mineral Rubber Finished Roofings.

THE WILLOUGHBY FORK & MFG. COMPANY, Willoughby, Ohio: Special illustrated catalogue of their Coke, Coal, Ballast, Sugar Beet, Cotton Seed, Sluice, Tanners', Oyster and Vegetable Scoop Forks for the season of 1901.

F. M. BOWER & Co., 165 Chambers street, New York: Illustrated descriptive catalogue of Tin, Iron, Copper and Wooden Ware articles and utensils used by bakers, pastry cooks, confectioners, &c., in hotels, restaurants, clubs and similar places.

HARRINGTON & RICHARDSON ARMS COMPANY, Worcester, Mass.: "Center Shots at Short Range" is the title of a very attractively printed booklet just issued by the company in which their line of H. & R. Guns and Revolvers are illustrated and described. The company emphasize the safety and reliability of the Fire Arms thus shown.

EAGLE LOCK COMPANY, Terryville, Conn.: A number of sheets for insertion in their catalogue, volume 18. They relate to Post Office Box and other Locks, Friction Toilet Hinges, Number and Name Clips, Brass and Bronze Label Holders, &c.

AMONG THE HARDWARE TRADE.

Albany Hardware Company, a corporation with a capital of $10,000, have succeeded Hopkins Bros., Albany, Ore., in the retail Shelf and Heavy Hardware, Stove, Tinware, Agricultural Implement and Sporting Goods business.

Greiner-Ricketts Hardware Company have lately embarked in business at Orange, Va., handling Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, Sash, Doors, &c.

C. Nelsen has recently commenced the Hardware, Stove and Sporting Goods business in Salix, Iowa.

J. W. Lewis & Sons, Yates Center, Kan., while the business at that point has been very satisfactory, have disposed of their branch Hardware store in Garnett.

M. M. Justus has sold out his half interest in the Hardware business at Bluffton, Ind., and the style will hereafter be Rogers & Cole.

Kingston Hardware Company, John W. Johnston, proprietor, Kingston, Mo., have lately embarked in business, carrying a general line of Hardware as well as Farm Machinery and Buggies and Wagons.

The Hardware and Stove business of Mertes & Krupp, Toledo, Ohio, will be continued under the same style, Mrs. Josephine J. Mertes buying the half interest owned by the late John P. Mertes.

J. W. Ryan has lately purchased the Hardware, Tinware, Stove and Sporting Goods stock of Ellis Bros., Salem, S. D., and will continue the business at the old stand.

John Myers has lately commenced the retailing of Hardware, Stoves, Tinware and Agricultural Implements in Comanche, Ind. Ter.

Allen & Howe is the style of a new firm at Oxfordville, Wis. They are dealers in Shelf and Heavy Hardware.

Holliday & Vincent are successors to Holliday & Jeffers at Amery, Wis.

Ditz & Mooney Hardware Company are successors to the Clarion Hardware Company, Clarion, Pa. They are increasing the stock thus acquired, which comprises a general line of Hardware, Agricultural Implements, Buggies, Wagons and Oil Well and Mill Supplies.

Carrollton Hardware Company have succeeded Blalock & Roop Hardware Company, Carrollton, Ga., and will continue the wholesale and retail business in Hardware, Stoves, Agricultural Implements, Glass Ware, Crockery, &c. The company advise us that they discount all bills.

The Gallup Hardware Company are now conducting the business formerly carried on by B. C. Gallup, Port Allegheny, Pa.

Marquette Hardware Company, Marquette, Mich., have removed to larger and more commodious quarters

Ed. C. Brown has purchased the Hardware business of Pearce & Huntley, Branchport, N. Y.

Lucius Fender Hardware Company is the style of a concern recently organized at Breckinridge, Texas.

John T. Seyler has disposed of his Hardware business at Twin Bridge, Mont., to Twin Bridge Lumber Company.

W. S. Maupin has lately engaged in the Hardware line at Blue Jacket, Ind. Ter.

M. H. Osgoodby, who has been the buyer and general manager of the Osgoodby Hardware Company, Nunda, N. Y., for the past seven and a half years, has bought out the business and will carry it on hereafter under his own name.

W. J. Courtney & Co., Springville, Iowa, have succeeded W. J. Courtney in the Hardware business.

W. S. Cox is successor to W. S. Cox & Co., Silver City, N. M., wholesale and retail Hardware, Agricultural Implements, Stoves, Tinware, Saddlery, Furniture, &c.

Robert Nicholson has disposed of his Hardware business in Gibbs, Mo., to T. A. Nicholson.

McKown, Norton & Co., Ogden, Utah, have bought the Hardware part of the stock formerly carried by Browning Bros. Company and removed it to their store.

Webster E. Peavey has succeeded Sorenson & Bullis. at McIntire, Iowa.

C. A. Newberry, wholesale and retail Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Plumbing, &c., Alliance, Neb., has recently put in a large amount of the Warren Hardware Shelving. As appears by a photograph sent us by Mr. Newberry, the attractiveness of the store has thus been greatly enhanced. We also have photographs showing the store, 18 x 40, one story, in which he embarked in business in Alliance ten years ago, and the front of his present building, 25 x 130 feet in dimensions, two stories and basement. Mr. Newberry also occupies a brick warehouse, 50 x 150 feet, and advises us that at the present time he is carrying a $30,000 stock.

Florida Hardware Company, Jacksonville, Fla., have been incorporated with a capital stock of $64,000. The business is principally wholesale, but some retailing is also done.

The Mickle-Burgher Hardware Company, Fort Worth, Texas, have been incorporated with a capital stock of $50,000. They will carry on the wholesale business in Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, Buggies, Wagons, &c.

MISCELLANEOUS NOTES.

Bay State Tap and Die Company.

Bay State Tap & Die Company, Taunton, Mass., recently organized, advise us that they will commence shipping taps early in June and expect soon thereafter to have a complete line of taps and dies.

Punches, Screw Drivers and Shears.

The Bridgeport Mfg. Company, Bridgeport, Conn., in a new catalogue just issued, showing a number of hardware specialties, emphasize the introduction of a number of new goods, now made by them. Among these are the Trump card punch, made entirely of steel, handle and jaw in one piece and nickeled. Another article is a No. 10 sewing machine screw driver, with solid steel blade 1½ inches long, having a light beechwood handle. In connection with the various other kinds and styles of screw drivers they are also making larger sizes. The company have also introduced the Waldorf steel laid straight trimmers, and will soon be in a position to supply a full line of bent trimmers, barbers' and bankers' shears. These shears have fine quality steel faces welded to malleable backs and are warranted. The blades are nickeled and the handles enameled. Other additions include Steelon shears, made from a special composition metal with steel adjusting screw, new style handle, and Argyle, Ideal, Blue Bell and Star brands of trimmers of improved quality. The company refer to their finely lighted polishing rooms and largely increased facilities in their new factory for special work in the shear line and the manufacture of metal specialties of all kinds, especially for the execution of large contracts promptly for goods of this general character. They have made no advances, while in some instances reductions in prices are noted.

Jennings' New A 7 1-2 Hand Saw.

C. E. Jennings & Co., 101 Reade street, New York, have issued booklet No. 3 of a series illustrating and describing various lines of fine mechanics' tools of their manufacture. This booklet is entitled "Narrow and Pointed," and illustrates Jennings' New A 7½ hand saw. The feature of this saw is that it is 6 inches wide at the butt and 1½ inches at the point, is made of the best refined spring steel, ground four gauges thin on the back, full beveled and set, has carved and full polished handle and four improved brass screws. It can be furnished in 16 to 28 inch lengths, rising by 2 inches, with a varying number of teeth to the inch according to the length of the blade. An important point made by the manufacturer is that a saw worn down by constant use becomes valuable to the owner, partly because it can be used for many purposes where a full width saw is unwieldy. The booklets are for free distribution by dealers, either with the manufacturer's name on or their own imprint, as the dealer chooses, for which no charge is made.

Original Measuring Spoons.

Enterprise Mfg. Company, Everett, Mass., are the makers of the Original measuring spoons here illustrated. The three sizes eyeleted together, as shown in

Fig. 1.—Original Measuring Spoon.

Fig. 1, can be used as seen in Fig 2 to accurately measure liquids named in cooking receipts, the three spoons having a capacity of one-quarter, one-half and three-quarter teaspoonful, by the use of which units any desired proportion can be quickly and correctly obtained.

Fig. 2.—Method of Using Spoon.

These spoons are graduated to 15, 30 and 45 drops, respectively, the ordinary teaspoonful, although supposed to hold 60 drops, often varying in size.

Ornamented Rim Locks.

Russell & Erwin Mfg. Company, 43-47 Chambers street, New York, and New Britain, Conn., have introduced an innovation in the production of rim locks, which heretofore have been plainly finished in black

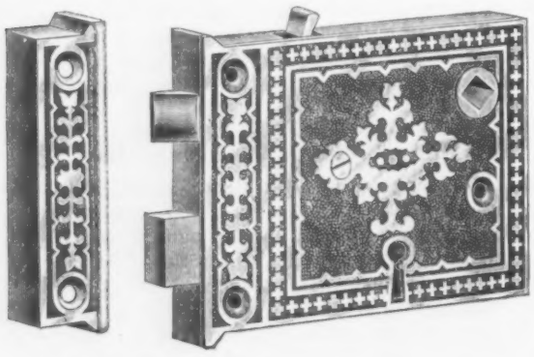


Fig. 1.—Century Design Two-Bolt Rim Lock.

japan. French lock makers have produced ornamental rim locks artistic in character and some American concerns have also, but the latter as special goods and not as regular articles of trade. With a view to breaking this dead level of uniformity, the company have adapted their well known Century design to a line of rim locks which are made both upright and horizontal and finished in Kahala bronze as well as bronze plated. Especial mention is made of the bronze plated style. The polished relief of the surfaces contrasts strikingly with the

Fig. 2.—Style of Key for Lock.

darker background, so that the ornamentation is thrown out boldly. It is believed the introduction of this type of locks will give new interest to a class of goods heretofore commonplace, especially as aside from their novelty they afford a good profit to the dealer. They are made with iron bolts and iron keys and brass bolts and steel keys, both in two and three bolt styles.

The Fox All Steel Pulley No. 10.

The Fox Machine Company, Grand Rapids, Mich., have added to their line of steel sash pulleys the one shown herewith. It is provided with a 2-inch wheel, and

Fig. 1.—The Fox All Steel Pulley No. 10.

may be used either in four-hole mortises made by boring from 13-16-inch holes in line with a ⅝-inch center with a single bit, or by means of the company's quadruple bit, which bores the four holes in one operation. It is also stated that a straight side machine mortise may be used if desired, which is made by the ordinary oscillating bit pulley mortising machine, the machine mortise being 13-16 x 2 1-16 inches in size. It is explained that from the character of the face of the pulley shell the pulley will present the same appearance, whether in a four-hole or in

Fig. 2.—Sectional View of Pulley No. 10.

a straight side mortise. The steel disks making up the wheel are secured together by the company's patent durable shouldered steel bushing, which, it is shown, provides a smooth, durable bearing for the wheel on the axle. The shell of the pulley is designed for extra durability and rigidity, and as it may be inserted in either style of mortise it is adapted to general use. The company are issuing a new catalogue of their pulleys, including the new No. 10.

Rapid Motion Health Treadle.

Slotkin & Praglin, 145-147 Mulberry street, New York, have adapted their Sharer improved rapid motion health treadle, originally intended for operating sewing machines, to a large number of new mechanical

Sharer Rapid Motion Health Treadle.

uses, one of which, here illustrated, is used in connection with an emery and buffing wheel. The illustration shows the motive power complete with table, drawers and necessary mechanism for revolving the wheels, although primarily they supply the treadle without cabinet work or machinery to be operated. Ordinarily it is sold as a complete set of iron work, legs, brace and working parts ready to receive any mechanism and cabinet work. The treadles proper have a swinging or pendulum motion, to which the whole strength of the legs may be applied, using one or both feet. A continuous positive motion is given to the driving shafts by multiplying gear that gives 30 to 1, and the revolutions are

always in one direction, treadles being furnished to produce revolutions in either of two directions at a maximum speed of 4600 revolutions per minute, which can be stopped almost instantly from full speed by a brake. The revolutions are always in either of two directions, according to the arrangement of the working gear, some requirements being in one direction, while others are in an opposite one. There is no dead center. This system of motive power is recommended by the manufacturers for operating almost any kind of light foot driven machinery. They are equipped to furnish to specifications numberless small machines in connection with the treadles, although the mechanic can fit his own or special machinery to the power. When the fly wheel is in the center it is incased as seen in the cut, but treadles can be furnished with fly wheels at the side which are not covered. Some of the machines driven by this style of power are small lathes, engravers' routers, small drill presses, circular, scroll, fret and jig saws, polishing and buffing wheels, small printing presses, &c., while this form of power is also suitable for dentists' use, spool winding and kindred uses.

Automatic Blind Hinges.

Hale & Benjamin, Greenfield, Mass., are manufacturing the automatic blind hinges for wood structures here illustrated. Fig. 1 shows the surface hinge, and Fig. 2 the flush hinge, the latter permitting the blind to lie

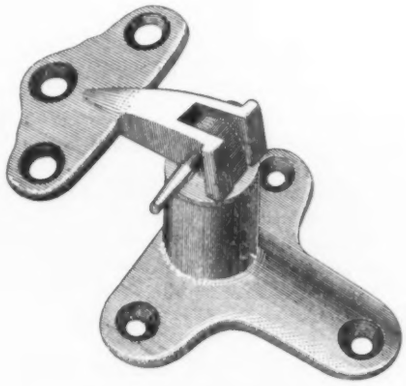


Fig. 1.—Automatic Surface Blind Hinge.

close to the house when open. The hinges have oil tempered steel springs, warranted by the manufacturers not to break, and steel case hardened collars. When these hinges are used no other fastenings are required to hold the blind open, half open or shut. No catches are necessary on the window sill to interfere with outside screens. Another advantage is that outside or storm

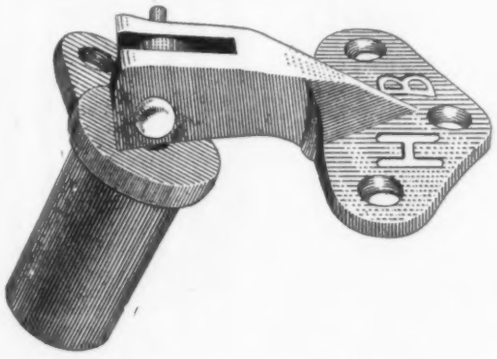


Fig. 2.—Automatic Flush Blind Hinge.

windows can be put on without removing the blinds. In fitting the flush hinge the hole for the barrel should be so bored that the last half of the cylinder must be driven in, making a snug fit, which is then held securely in place by a screw, the surface hinge being put on entirely with screws. This concern also make the Streeter automatic hinge for brick buildings, embodying somewhat similar principles.

Paper Shell Reloading Implements.

The Ideal Mfg. Company, New Haven, Conn., are putting on the market devices for reloading smokeless powder paper shells, as herewith illustrated. Implement No. 1 is designed to reform the shell to its original shape

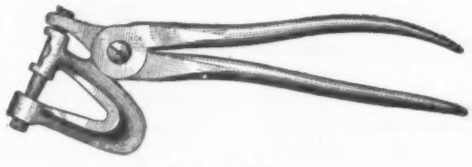
No. 1. No. 2.

Paper Shell Reloading Implements.

and size. It is explained that one trouble heretofore experienced in reloading paper shells has been that the shells were expanded, especially at the metallic portion, so that they would not enter the chamber of the gun freely. When the expanded shell is driven in and out of the die No. 1, it is stated that it will be reformed to its original shape and size. The manufacturers remark that the greatest annoyance experienced has been in seating the wads. It is stated that after paper shells have been crimped and fired the muzzle of the shell is left soft and out of true, so that it is impossible to seat proper sized wads on the charges without tearing or distorting the muzzle of the shell. The shell receiver, No. 2, may be used, it is remarked, in connection with the Ideal loading machine, to overcome this trouble. The cone shaped fingers are made of light spring brass, and extend downward within the shell, so that the wads can slip easily on the metallic surface, and be seated on the charge, as required. When the muzzle of the shell is turned with a round crimp the cartridge, it is remarked, will be found to be as good as new. The implements will be made for 10, 12 and 16 gauge only.

Lever Belt Punch.

Tower & Lyon, 93 Chambers street, New York, have just put on the market the No. 211 lever belt punch here illustrated. It is 10 inches long over all, has a fine tool steel cutter ¼-inch in diameter and the handles and frame are malleable iron. It is designed for heavy sole



Lever Belt Punch.

leather belting, which is cut with ease owing to the powerful leverage and quality of the cutter. It can also be used in connection with rubber belting, of light, medium and heavy grades.

The Taintor Positive Saw Set No. 1900.

The accompanying cuts illustrate improvements recently made by the Taintor Mfg. Company, 9-15 Murray street, New York, in their Positive saw set. In Fig. 1 the saw set is shown in its improved form. A single spring has been substituted for the two springs to operate the punch and handles. In this connection the lower handle has been simplified in construction. The arrangement of the punch has also been improved, so that it can now be easily taken out and replaced. The punch swings on a rivet, passing through the frame, and can be taken out by unhooking it from the rivet and passing it back between the handles, by first removing the spring and anvil and spreading the handles. In use the lower handle carries the punch, which forces the tooth of the saw against the face and side of the anvil, which is shown in Fig. 2. The upper handle clamps the saw against the lower side of the anvil, and also holds the tooth so it cannot slip while the bending is being done. Consequently the finest teeth may be set near their points. The difference in the thickness of different saws is provided for automatically. The anvil has ten sides, each giving a different set, while the faces are of three lengths placed in lettered divisions. The only adjustment necessary is placing the face of the anvil giving the desired setting in front of the punch, and when so placed it cannot slip. Any setting may be repeated an indefinite number of times, because a given face of the anvil will always give the saw the same set. For this reason the tool is called the Positive. A front view of the set is given in Fig. 3, showing a saw in position. The set is light, strong and durable, nicely finished in nickel plate, and is guaranteed in all parts. It is made entirely of steel; the anvil and punch of the best tool steel, and the frame and handles of rolled steel.

Fig. 1.—The Taintor Positive Saw Set No. 1900.

Fig. 2.—The Taintor Saw Set Anvil.

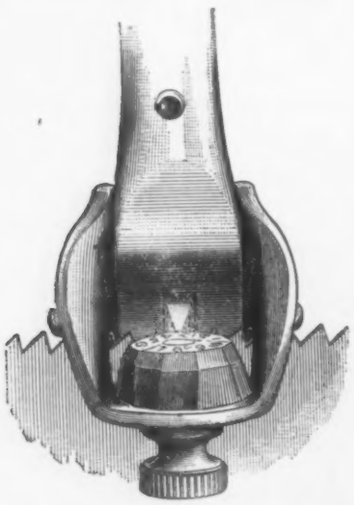
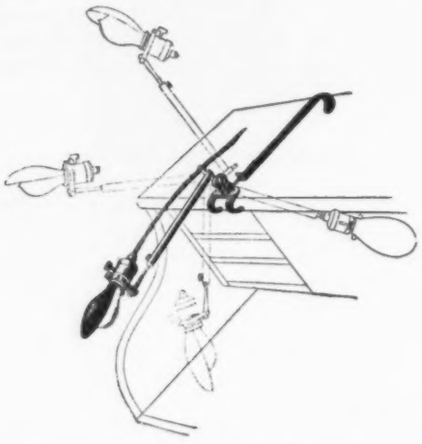


Fig. 3.—Front View of Taintor Saw Set.

Ferguson Electric Light Bracket.

The Smith & Hemenway Company, 296 Broadway, New York, have just put on the market the Ferguson adjustable electric light bracket, as here illustrated. It is suitable for any style or size of roll top desk or upright piano, and can be fastened to the wood work without using screws or nails. The reflector can be placed at any desired angle to protect the eyes from an injurious glare. It is ornamental in appearance, the finish being enamel and nickel. Other characteristics referred to by the manufacturers are its simplicity in construction and operation, ease with which it is quickly adjusted, no springs to make an imperfect contact or get out of order, and the moderate price at which it is sold. The cut illustrates a few of the many angles possible with this bracket.



Ferguson Adjustable Electric Light Bracket.

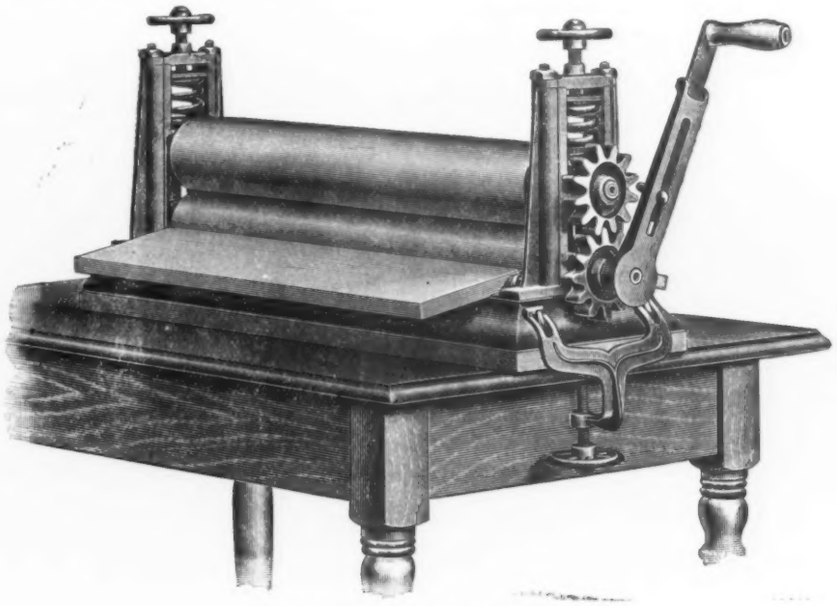
Warren's Axe and Scythe Stand.

The accompanying cuts represent a scythe and axe stand offered by the J. D. Warren Mfg. Company, Chicago, Ill. The stand is adapted to hold and display scythes and handled axes, each in their season. It is mounted on casters, and is referred to as neat, attractive and strongly made. A stand for this purpose has been made by the company for some years, but as now constructed embodies new features.

Warren's Axe and Scythe Stand.

The Household Mangle No. 21.

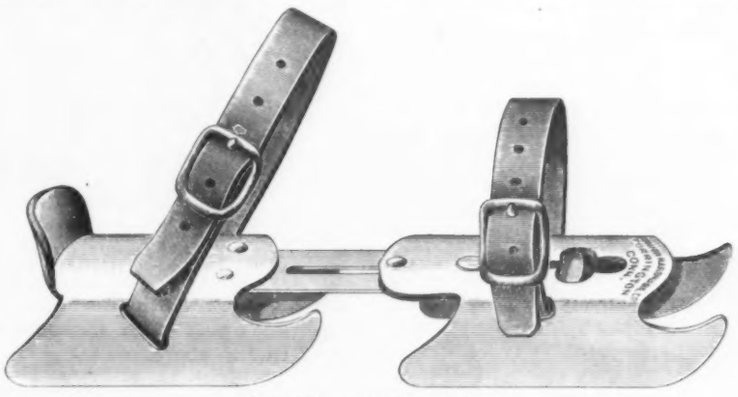
Herewith illustrated is a household cold mangle, manufactured by the Lawson Novelty Company, 115 Lake street, Chicago, Ill. The mangle is designed for domestic use. The machine is constructed with a strong coil spring at the end of the rolls. The shaft of the upper roll revolves on sliding journals so that the rolls may adjust themselves to the varying thickness of the goods. The mangle is geared to run smoothly and easily, and is supplied with an adjustable crank which can be made longer or shorter. The pressure between the rollers can be adjusted, it is explained, up to 700 pounds by the aid of the hand wheels above the coil springs. The mangle is so made that it can be readily attached to a table or shelf, and is made reversible so that it can be operated by either the right or left hand. The rollers are 4 inches in diameter, 24 inches long, and the machine occupies a floor space 15 x 30 inches.



The Household Mangle No. 21.

Bob Sled Extension Skate.

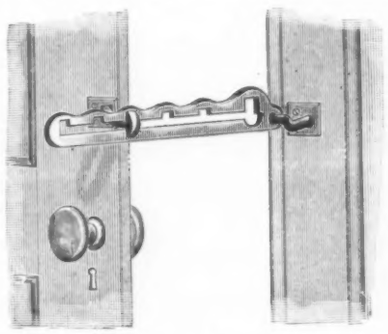
The Union Hardware Company, Torrington, Conn., New York office with Tower & Lyon, 95 Chambers street, have just put on the market for the coming season a bob sled skate for children, as here shown. The peculiarity of this skate which distinguishes it from similar skates previously on the market is that it is of an extension pattern, so that but a single size is required, the minimum and maximum lengths being 6 and 9 inches, respectively. It has two runners set wide apart, the advantage of which is apparent with children learning to skate, the unusual strain upon the ankles being entirely relieved. Such a skate can also be used by children under certain conditions on smooth sidewalks and asphalted streets, &c., when there is a thin coating of ice or snow, where ordinary skating would be out of the question.



Bob Sled Extension Skate.

The Darby Door Lock and Adjuster.

The accompanying illustration represents a door lock and adjuster put on the market by P. J. Conroy, Philadelphia, Pa. The device can be used upon either right or left hand door, and can be adjusted at any notch on the bar. It is self locking and is referred to as being admirably adapted to bedroom or outside doors, either single or double, as it keeps doors stationary and allows free ventilation.



The Darby Door Lock and Adjuster.

The East End Hardware Company, Ironton, Ohio, have been incorporated with a capital stock of $10,000. They handle Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c. The corporation is composed mainly of former employees of Hutsinpillar & Sheridan.

The Reka Cash Register.

The Whiting Mfg. Company, Northboro, Mass., have added to their line the cash register shown in the accompanying illustrations. The check system, it is remarked, has been so perfected that the check exhibits the transaction, adds an amount corresponding to the denomination of the check and opens the cash drawer. The four check compartments are equivalent to four columns in cash book, the first column being for cents the second for tens of cents, the next for dollars and the fourth for tens of dollars. Thus it is necessary to use checks of only nine different denominations, but each register is supplied with four checks of each denomination to enable the operator to record an amount where all the figures are of the same denomination, as, for instance, $99.99. When a sale is to be recorded checks are selected from the supply rack to represent the amount of the sale, for example, $98.65, as shown in the cuts. This requires four checks—9, 8, 6 and 5—which are inserted in their respective slots. Then the handle, at the right of the register, is moved forward, which brings the checks to the position shown. Recording even dollars or tens of dollars requires only one check. Each check as it passes through the register adds an amount to the counter corresponding to the denomination, opens the cash drawer and is then discharged into a tray ready to

Fig. 1.—The Reka Cash Register.

be used again. It will record and add every transaction, it is stated, from 1 cent to $99.99. Records of departments or clerks' sales are autographically recorded on the detail slip, it is pointed out, the strip automatically moving forward each time the register is operated, carrying the previous records under a glass, where the last 15 transactions are shown. It is stated that purchases made from different departments, but paid for as one sale, can be recorded in each department, yet adding and exhibiting the total amount, which operation, it is claimed, is peculiar to this register. To open the cash drawer for change, &c., a "No Sale" key is employed with a counter attached. "Paid Out," "Received on Account" and "Charge" entries are readily recorded. The register is adapted to all classes of business, as various styles of ruling and headings are arranged to suit the wishes of each purchaser without making any change in the machine. It is pointed out that the register is not only adapted to the use of hardware dealers, but that it may be kept in stock and sold by them, as an assortment of various styles is not necessary to meet requirements. The registers are also arranged for all currencies with a trifling change, including the pounds, shillings and pence of the English currency. The mechanical working parts of the register are of metal, for which the makers claim simplicity, strength and durability; also that the register is constructed in a thorough manner. The practical working of the register has received a large amount of

Fig. 2.—Check Receiving Drawer of Register Removed, Showing the Counters.

attention, while the case is of decorated oak, designed to harmonize with the most elaborately fitted establishment. The register is sold at a comparatively low price and is guaranteed by the manufacturers for two years.

Automobile Initial Hanger.

Charles E. Miller, 97-101 Reade street, New York, dealer in everything to build automobiles and bicycles, has just put on the market an initial hanger, as here illustrated. This hanger, made from highly finished grain leather in black, has aluminum letters 3 inches high, brightly polished and riveted to the leather, which is then folded and sewed around the edge and fitted with two eyelets, as shown in the illustration, for fastening the hanger on back of seat or body of an automobile. This hanger is regularly made in two sizes—for two letters 5 x 8 inches and three letters 5 x 12 inches. The use of such a device was made compulsory in this State

Initial Hanger for Automobiles.

by a law signed by the Governor April 25, 1901, compelling every owner of an automobile to carry his initials as referred to above.

L. D. Scott Implement & Buggy Company are successors to C. Scott & Son, Vincennes, Ind. They have lately moved to a new building at 26 and 28 North Second street, which is 40 feet wide and 160 feet long, two stories and basement. In the construction of the building provision has been made for a fine show window.

Current Hardware Prices.

REVISED JUNE 4, 1901.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓@33⅓&10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00....33⅓@33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%
Taplin's Perfection.....50%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 7¼@7¾¢
Hay-Budden, Wrought.....9@9½¢
Horseshoe brand, Wrought.....9½@9¾¢
Samson.....₩ lb 7½@8¢
Trenton, Wrought.....₩ lb 8¼@8¾¢

Imported—

Peter Wright's.....9½@9¾¢

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull Bros. Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Com. Double Spur.....70@..%
Boring Machine Augers.....60&10&10@70&10%
Car Bits, 12-in. twist.....60@60&10%
Jennings' Pattern:
Auger Bits.....50&10&5@60%
Ford's Auger and Car Bits.....40&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 1 o ext. lip. R. Jennings' list....40%
No. 30. R. Jennings' List.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits 15&10@15&10&5%
Mayhew's Countersink Bits.....45%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, $18; large, $26.....50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $36; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....60%

Gimlet Bits—

Common Double Cut..gro. $2.25@3.75
German Pattern.....gro. $3.25@4.50
Double Cut, makers' lists.....50&5%@50&10%

Hollow Augers—

Bonney Pattern, per doz. $11.00@11.50
Ames.....25&10%
New Patent.....25&10%
Universal.....20%
Wood's Universal.....25%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered.gro.65@66c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. $1@1.10
Unhandled, Shouldered.gro.60@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands.$5.50@5.75
First Quality, other brands$5.25@5.50
Jobbers' Special Brands:
Good Quality.....$5.00@5.25
Best Quality.....$5.25@5.75
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—Iron or Steel.

Concord, Loose Collar....4½@5c
Concord, Solid Collar....4¾@5½c
No. 1 Common.....5¼@5¾c
No. 1½ Com. New Style..5¼@5¾ c
No. 2, Solid Collar.....4¾@5½c
Nos. 11 to 14.....70¢10@75&5%
Nos. 15 to 18.....60¢10@60¢10¢5%
Nos. 19 to 22.....75¢5@75¢10%

5% cash 10 days.

Boxes, Axle—

Common and Concord, not turned..lb. 5c
Common and Concord, turned..lb. 6c
Half Patent.....lb. 8@9c

Balances—Sash—

Caldwell new list.....50%
Pullman's.....60%

Spring—

Spring Balances....50&10@50¢10¢5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%
Pe ouze.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb..2.90@3.10c

Beams, Scale—

Scale Beams, List Jan. 12, '83.30&10%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters—Egg—

Standard Co.:
No. 5 Steel Handle Dover, ₩ gro. $6.50
No. 10 Cast Handle Dover, ₩ gro. $8.00
No. 10 Steel Handle Dover, ₩ gro. $8.00
No. 15 Extra Heavy Steel Handle, ₩ gro. $15.00
Rival, ₩ gro.....$10.00
Taplin Mfg. Co.: ₩ gro.
No. 50 Small Family size.....$6.50
No. 100 Regular Family size.....$8.00
No. 102 Regular Family size tinned.....$9.50
No. 150 Large Family size.....$15.00
No. 152 Large Family size, tinned.....$17.00
Lyon's, Standard size.....₩ doz. $1.75
Wonder (S. S. & Co.).....₩ gro. $7.50

Bellows—

Blacksmith, Standard List.70@70&10%
C. E. Jennings & Co., Blacksmith...60&10%
C. E. Jennings & Co., Hand.....33⅓&5%

Blacksmiths—

Inch..	*30*	*33*	*34*	*36*	*38*	*40*
Each..	*$3.50*	*3.75*	*4.25*	*4.80*	*5.35*	*6.15*

Extra Length:
Each..$4.00 4.55 5.10 5.60 6.40 7.50

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz...	*$6.75*	*7.25*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.7*	*6.75*

Net Prices.

Bells—Cow—

Ordinary goods.....75c&5@75c&10%
High grade.....70¢@70¢10%
Jersey.....75&10%
Texas Star.....50&10%

Door—

Abbe's Gong.....45%
Barton Gong.....55%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....20&10&10%
Yankee Gong.....55%

Hand—

Hand Bells, Polished.....60&5@66⅔&5%
White Metal.....55@55&10%
Nickel Plated.....50@55&10%
Swiss.....60@60@71½%
Silver Chime.....33⅓@33⅓&10%

Miscellaneous—

Farm Bells.....lb. 2@2½c
Steel Alloy Church and School.....50&10¢5@60%
Wilmot & Hobbs Mfg. Co, Gongs.....70%

Belting—Rubber—

Agricultural (Low Grade).75&10@30%
Common Standard.....75@75&10%
Standard.....70@70&10%
Extra.....60&10&5%
High Grade.....50¢10@50¢10¢5%
Boston Belting Co.:
Seamless Stitched, Imperial.....45&5%
Boston.....50&5%
Niagara.....60&5%

Leather—

Extra Heavy, Short Lap..50¢10@60%
Regular Short Lap 60¢10@60¢10¢5%
Standard.....60¢10¢10@70¢5%
Light Standard.....70@70¢10%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....40@50%

Bicycle Goods—

John S. Long's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70@70¢10%
Cleveland Steel.....60&10@70%
Ford's Star Brand Self Lubricating.....60&10%
Hollow Steel, Ford's Pat. Star Brand.....50&10%
Lane's Patent Automatic Lock and Junior.....30%
Stowell's Novelty, Mal. Iron.....50%
See also *Machines, Hoisting.*

Boards Stove—

Zinc, Crystal, &c.....40¢10@..%

Bolts—

Carriage, Machine &c.—

Common, list Jan. 30, '95...65&10@..%
Norway Iron, $3.00, list Oct. 7, '84..80@80&5%
Phila. Eagle, $3.00 list May 24, '99....80@80&10%
Bolt Ends, list Jan. 30, '95.70¢7½@..%
Machine, list Oct. 1, '99.....70¢7½@..%
Machine with C. P., C. & T. Nuts.65¢13½%

NOTE—*The rapid advances in manufacturers' prices enable the jobbers to cut prices freely.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.26*	*.30*	*.39*	*.47*	*.65*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.25*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*1.05*	*1.30*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.57*	*.80*	*1.00*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.44*	*.50*	*.61*	*.70*	*1.28*

Wrought Barrel.....70¢10@75&5%
Wrought " Bronzed.40¢5@50¢10%
Wrought Flush, B. K..50¢10@60¢10%
Wrought Shutter...40¢10¢10@60¢5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50¢10%
Ives' Patent Door.....60%

Stove and Plow—

Plow.....60¢10@..%
Stove.....77½@77½¢10%

Tire—

Common.....75@75¢10%
Norway Iron.....80@80¢5%
American Screw Company:
Norway Phila., list Oct. 16, '84....82½%
Eagle Phila., list Oct. 16, '84.....85%
Bay State, list Dec. 28, '99.....77½%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84..83½%
Eagle Phila., list Oct. 16, '84.....85%
Eclipse, list Dec. 28, '99.....77½%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....77½%
Keystone Phila. list Oct. '84.....85%
Norway Phila., list Oct. '84.....82½%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.50*	*5.00*	*5.75*	*7.25*
Inch.....			*2¼*	*2½*
Per Doz.....			*$8.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boring Machines—*See Machines, Boring.*

Boxes Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*

Common Ball, American...$1.15@1.25
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford s.....60%
Fray's No. 70 to 120, 81 to 138, 207 to 414.....60%
C. E. Jennings & Co.....50&10%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Patent..50%
P. S. & W. Co., Peck's Patent 50&10@60%

Brackets—

Wrought Steel.....70¢10@75¢5%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%
Griffin's Pressed Steel.....5%
Griffin's Folding Brackets.....70&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....75%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96.....40@40¢5%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@50¢10%
Fast Joint, Narrow.....50@50¢10%
Loose Joint.....70¢5@70¢10%
Loose Pin.....70¢5@70¢10%
Mayer's Hinges.....70&5@70¢10%
Parliament Butts.....70¢5@70¢10%

Wrought Steel—

Loose Joint
Table and Back Flaps.
Narrow and Broad.....
Inside Blind..... } 70¢10@75%
Loose Pin
Loose Pin, Ball and Steeple Tip

Bronzed Wrt. Nar. and Inside Blind Butts.....60¢10@60%

Cages, Bird—

Hendryx, Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4@4½c
Sharp, 1 prong.....per lb. 4½@4¾c
Perkins' Blunt.....₩ lb 5 ¢
Perkins' Sharp.....₩ lb 5½¢

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 75	2.10	2.25	each.
Iowa Pattern....	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	20	30	40	qts.
New York Patt'rn	3.00	3.25	3.40	each.
Balt more Patt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	108 gro

Caps—Percussion—

Eley's E. B.....50c
G. D.....per M 32@34c
F. L.....per M 37@40c
G. E.....per M 47@50c
Musket.....per M 57@60c

Primers—

Berdan Primers, $1.00.....5%
B. L. Caps (Sturtevant Shells) $1.00.....5%
All other primers.....$1.10@$1.15

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—
Blank Cartridges:
32 C. F., $5 50.....10@5%
38 C. F., $7 00.....10@5%
22 cal. Rim, $1.50.....10@5%
32 cal. Rim, $2.75.....10@5%
B. B. Caps, Con., Ball Swgd.$1 85@1.90
B. B. Caps, Round Ball...$1.12@1 18
Central Fire.....25%
Pistol and Rifle.....15@5%
Primed Shells and Bullets.....15@5%
Rim Fire Sporting.....50%
Rim Fire, Military.....15@5%

Casters—
Bed.....70@70@10%
Plate.....75@75@10%
Philadelphia.....75@75@10%
Boss.....70@10%
Boss Anti-Friction.....70@10%
Martin's Patent (Phoenix).....45%
Payson's Anti-Friction.....10@10@10%
Standard Ball Bearing.....45%
Tucker's Patent, low list.....30%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—
NOTE.—*Manufacturers usually quote Chain at delivered prices.*
American Coil, Cask lots:

5-16	¼	5-16	¾	7-16	½	9-16
7.15	5.55	4.55	3.70	3.55	3.45	3.40
¾	¾	⅞ to 1		1¼ to 1¾ inch.		
3.40	3.35	3.35c. per lb.		5.50 per 100 lb.		

Less than Cask lots add 25c.
German Coil, list July 24, '97.60@10@10%

Halters and Ties—
Halter Chains.....50@10%
German Halter Chain, list July 24, '97.....60@10@10%
Cow Ties.....60%

Trace, Wagon, &c.—
Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$30.00
6½—6-2, Straight, with ring..$31.00
6½—6-2, Straight, with ring..$35.00
6½—10-2, Straight, with ring..$33.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains..50@10@5@10@5%

Miscellaneous—
Jack Chain, list July 10, '93:
Iron.....60@60@10%
Brass.....60@60@10%
Safety Chain.....70@5@70@10%
Gal. Pump Chain.....lb 4½@4¼@
Covert Mfg. Co.:
Breast.....35@2%
Halter.....35@2%
Heel.....35@2%
Rein.....35@2%
Stallion.....35@2%
Covert Sad. Works:
Breast.....70%
Halter.....70%
Hold Back.....70%
Rein.....70%
Oneida Community:
Am. Coil and Halters....50@10@5@60%
Am. Cow Ties.....35@5@40@5%
Eureka Coil and Halter.....60@40@5%
Niagara Coil and Halter.....60@60@5%
Niagara Cow Ties.....45@5@45@10@5%
Wire Goods Co.:
Dog Chain.....60@10%
Universal Dbl-Jointed Chain.....50%

Chalk—(From Jobbers.)
Carpenters' Blue.....gro. 42@45c
Carpenters', Red.....gro. 37@40c
Carpenters', White.....gro. 33@35c
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's.....40@10%
Columbia.....50@10%
Eclipse.....60@60@10%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Farmers', Carpenters', etc., Chests, with Tools.....30%
Machinists' and Pipe Fitters' Chests, Empty.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....30%

Chisels—
Socket Framing and Firmer
Standard List.....70@70@10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60@10%
C. E. Jennings & Co. Socket Framing No. 15.....60@10%
Swan's.....70@5%
L. & I. J. White.....30@30@5%

Tanged—
Tanged Firmers.....40@5@40@10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 101, 181....25%
L. & I. J. White, Tanged.....35@5%

Cold—
Cold Chisels, good quality.lb. 13@15c
Cold Chisels, fair quality..lb. 11@12c
Cold Chisels, ordinary.....lb. 8@9c

Chucks—
Beach Pat., each $8.00.....20%
Massey's Planer and Milling.....15@20%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard...30%
Drill Chucks, New Model.....25%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....20%
Universal Lathe Chucks.....40%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Czar Drill.....30%
Geared Scroll.....90%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%

Clamps—
Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P., S. & W. Co.40&10%
Carriage Makers' Sargent's.....50&10%
Beaty, Parallel.....3½&10%
Lineman's, Unica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners Walk—
Star Socket, All Steel....₩ doz. $4.00 net
Star Shank, All Steel....₩ doz. $3.75 net
W. & C. Smaar, All Steel, 7½ in. ₩ doz., $3.35; 8 in., $3.40; 8½ in., $3.50.

Cleavers, Butchers'—
Foster Bros.....30%
New Haven Edge Tool Co.'s.....40&10%
Fayette R. Plumb.....33⅓&10%
P., S & W.....33⅓&5@33⅓&10%
L. & I. J. White.....25%

Clippers—
Chicago Flexible Shaft Company
Handy Toilet.....₩ doz. $7.20
Mascotte Toilet.....₩ doz. $3.40
Monitor Toilet.....₩ doz. $9.00
Stewart's Patent.....₩ doz. $10.00

Clips Axle—
Eagle and Superior ¼ and 5-16 inch.....70@10%
Norway, ¼ and 5-16 inch..70@70@10%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—
Hardware list (Globe, Kerosene, Racking, &c.).....65@10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list.....40%
Embossed, Gilt, Pope & Stevens' list30&10%
Leather Pope & Stevens' list.....40%

Compasses Dividers, &c.
Ordinary Goods.....70@10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....25&10%

Compressors Corn Shock—
J. B. Hughes' ₩ doz.....$2.50

Conductor Pipe, Galva.—
L. C. L. to Dealers:

Territory	*Not nested.*	*Nested.*
Eastern....	*70@2½%*	*70@5%*
Central.....	*65@10%*	*70%*
Southern..	*65%*	*65@2½%*
S. Western.	*60@12½%*	*60@15%*

Terms 2% for cash.
Jobbers receive extra 12½@2½ on carloads loose, and extra 12½ on carloads crated.
See also *Eave Troughs.*

Coolers, Water—

Nos....	½	3	4	6
Labrador	$11.50	$14.00	$17.50	$20.00
8 gal. $24.00				
Nos	3	4	6	8
Iceland..	$23.00	$25.00	$30.00	$37.50
10	14 gal. $57.00	$72.00		

Coopers' Tools—
See *Tools, Coopers'.*

Cord—Sash—
Braided, Drab.....lb. 25c
Braided, White, Common, lb17½@18c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....lb 9 @9½c
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....lb. 12½@13c
Cable Laid Fussia.....lb. 13½@14c
India Hemp, Braided.....lb 14@15c
India Hemp, Twisted.....lb. 10@12c
Patent India, Twisted.....lb.10@12c
Pearl Braided, cotton.....₩ lb 17@18¢
Massachusetts, White.....₩ lb 22½¢
Massachusetts, Drab.....₩ lb 26½¢
Eddystone Braided Cotton.....₩ lb 19¢
Harmony Cable Laid Italian....₩ lb 18¢
Ossawan Mills:
Crown, Solid Braided White...₩ lb 18¢
Braided, Giant, White.....₩ lb 17¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson:
Braided, Drab Cotton.....₩ lb 32½¢
Braided, Italian Hemp....₩ lb 32½¢
Braided, Linen.....₩ lb 49¢
Braided, White Cotton, Spot.₩ lb 28½¢
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

Wire, Pictures—
Braided or Twisted.....85@85&10%
Note.—There is a good deal of confusion in lists, some using old list and others the new list.

Corn Knives and Cutters—See *Knives, Corn.*

Corn Planters—See *Planters, Corn.*

Crackers, Nut—
Little Giant.....₩ gr. $24.00

Cradles—
Grain.....50%

Crayons—
White Round Crayons, gross.5½@6c
Cases, 100 gro., $4.50, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy.....₩ doz. $7.00
Fort Madison, Light.....₩ doz. $6.50

Crow Bars—See *Bars, Crow*

Cultivators—
Victor Garden.....₩ doz. $10.00

Cutlery Table—
"Gross Goods," list Jan. '01..net@5%
Extra 10% to purchasers of $250 worth in six months.
International Silver Company:
No. 12 Medium 8 knives, 1847..₩ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor.....₩ doz. $3.00
Wm. Rogers & Son.....₩ doz. $2.50
Simeon L. & Geo. H. Rogers Company:
12 dwt. Medium Knives.....₩ doz. $3.00
No. 77 Medium Knives.....₩ doz. $2.50

Cutters—Glass—
H. H. Mayhew Co.....50%
Smith & Hemenway Co.....30%

Meat—
Hale's..Nos. 11 & 111 12 & 112 13 & 113
Per doz.. $10.80 12 20 18.00
American.....30%

Nos.....	1	2	3	4	B	5
Each.....	$5	$7	$10	$25	$50	$60

Connecticut.....50%

No...	20	40	60	8	10	12
Each	$1.75	2.00	2.25	3.00	3.00	4.00

Enterprise.....25@25&7½%

Nos.....	5	10	12	22	32
Each.....	$2	$3	$2.50	$4	$6

Dixon's, ₩ doz.....33⅓&10%

Nos..	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Home No. 1, ₩ doz. $22.75.....50&10%
Little Giant, ₩ doz.....33⅓@33⅓&5%

Nos.	305	310	312	340	322
	$35.00	$48.00	$44.00	$73.00	$68.00

Sterling.....33⅓&5%

Nos	1	2
Each	$3.00	$2.50

Miles' Challenge, ₩ doz.....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₩ doz. $24.00...
.....33⅓&5%
Woodruff's, ₩ doz.....40%

Nos	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₩ doz. $60.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₩ gr....$18@$20
Slaw Cutters, 2 Knife, ₩ gr....$22@$36

Tobacco—
All Iron, Cheap.....doz. *$4.25@$4.50*
Enterprise.....25@30%
National, ₩ doz. $21.00.....40%
Sargent's, ₩ doz. $24.00.....45&10%

Washer—
Appleton's, ₩ doz. $16.00....50&10&10%
Bonney's.....40%

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz.$10.00
Iwan's Improved Post Hole Auger....40%
Iwan's Perfection Post Hole Digger.
₩ doz. $9.00
Kohler's Universal.....₩ doz. $14.00
Kohler's Little Giant.....₩ doz. $14.00
Kohler's Hercules.....₩ doz. $12.00
Kohler's Invincible.....₩ doz. $10 00
Kohler's Rival.....₩ doz. $9.00
Kohler's Pioneer.....₩ doz. $9.00
Never-Break Post Hole Diggers, ₩ doz. $24.00.....60%
Samson, ₩ doz. $34.00.....25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₩ doz. $18; No. 2, $15 No. 3, $14; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill..each $1.50@$1.75
Blacksmiths' Self-feeding.....*each $3.75@4.00*
Breast, Millers Falls, each $3.00..15&10%
Breast, P., S. & W.....30@30&10%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....25&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....20@25%
Ratchet, Whitney's, P. S. & W...40&10%
Whitney's Hand Drill, No. 1, $10.00:
Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—
Standard List.....*60@65@65&5%*

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Balsey's Screw Holder and Driver, ₩ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9...40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....30%
Champion.....40&10%
Douglass Mfg. Co.....20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay's Double Action Ratchet.....35%
Goodell's Automatic
50&10&10@50&10&10&5%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....40&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1,50,55 and 60.....50&10&10%
Nos. 20 and 40.....60⅔&10%
Screw Driver Bits.....₩ doz. 50@70¢
Smith & Hemenway Co.....40&5%
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....60&10%
No. 86.....70&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*L. C. L.*	
Eastern.....	*75@10%*	*Carloads extra 12½%*
Central.....	*75@7½%*	
Southern.....	*70@12½%*	
S. Western.....	*70@10%*	

Terms, 2% for cash.
See also *Conductor Pipe and Elbows.*

Egg Beaters—See *Beaters, Egg*
Egg Openers—
See *Openers, Egg.*

Elbows and Shoes—
Factory shipments.....60@60&10%
Perfect Elbows (S. S. & Co.).....40%

Emery, Turkish—

	4 to 46	*54 to150*	*Flour*
Kegs.....*lb.*	*5c*	*5½c*	*5¾c*
½ Kegs....*lb.*	*5½c*	*5¾c*	*5¾c*
¼ Kegs....*lb.*	*5c*	*6c*	
10-lb cans, 10 in case.....	*6½c*	*7c*	*6c*
10-lb. cans, less than 10....	*10c*	*10c*	*8c*

NOTE.—*In lots 1 to 3 tons a discount of 10% is given.*

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%

Faucets—
Cork Lined.....70@5@70@10@5%
Metallic Key, Leather Lined.....70@70@10%
Red Cedar.....50@50@5%
B. & L. B. Co.:
Lockport, Metal Plug, reduced list60&5%
Star.....60@60&5%
Star, Metal Plug new list...40@40&5%
West's Lock, Open and Shut Key50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined 50&10%
John Sommer's Common Cork Lined.70%
John Sommer's Chicago Cork Lined..60%
John Sommer's O. K. Cork Lined.....50%
John Sommer's Perfection Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....35%
Improved, ¾ and ⅞ inch.....35%
Self Measuring:
Enterprise, ₩ doz. $36.00.....40&10%
Lane's, ₩ doz. $36.00.....40&10%
National Measuring, ₩ doz. $36.00...40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands.....70@75@5%
Good Brands.....75&10@75@10@10%
Fair Brands.....80@80@10%
Second Quality.....80@10@80@25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....35%

Fixtures, Grindstone—
Net Prices:

Inch,...	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.60*	*2.75*	*3.00*	*3 50*	*4.40*

Stowell's Giant Grind stone Hanzer.....
₩ doz $6.00
Stowell's Grindstone Fixtures.....50%
P., S. & W. Co.....50&10&10%
Reading Hardware Co.....30&20&10%
Sargent's.....60&10&10%

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Sept. 1, 1900, list.
Grain or Barley Forks, 12 to 20 inches.....70@65%
Hay, 2 tine.....65%
Hay, 3 tine.....66⅔%
Hay, 4 tine, Header and Barley Forks, 13 to 16 inches.....66⅔%
Manure, 4 tine.....70%
Manure, 5 and 6 tine.....70%
Spading.....70@5%
Iowa Dig-Ezy Potato.....65%
Victor, Hay.....66⅔%
Victor, Manure.....70%
Victor, Header.....60&30%
Champion, Hay.....66⅔%
Champion, Manure.....70%
Columbia, Hay.....66⅔&5%
Columbia, Manure.....70%
Columbia, Spading.....70%
Hawkeye Wood Barley 4 tine ₩ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&20&7½%
Acme Manure.....60&25%
Dakota Header.....70&10&2½%
Jackson Steel Barley.....70&10&2½%
Kansas Header.....65&20%
W. & C. Favorite Wood Barley 4 tine, ₩ doz., $5.00; 5 tine, $6.00
Plated.—See *Spoons.*

Frames—Saw—
Red, Polished and Varnished..doz, $1.15@$1.50
White.....*doz. 75@80c*

Screens and Frames—
See *Screens.*

Freezers, Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best..	*$1.45*	*1.65*	*1.95*	*2.40*	*3.40*	*4.20*
Good	*$1.25*	*1.40*	*1.70*	*2.15*	*2.75*	*3.75*
Fair..	*$1.00*	*1.10*	*1.30*	*1.75*	*2.30*	*2.90*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—
Per 1000 Feet.
Hemp Fuse.....*$2.60*
Cotton Fuse.....*2.90*
Single Taped Fuse.....*3.25*
Double Taped Fuse.....*4.20*
Triple Taped Fuse.....*5.00*
10@5@5%

Gates, Molasses and Oil—
Stebbins'.....80&10@80&10@10%

Gauges—
Marking, Mortise, &c......
55&10@55&10@10%

Barrett's Comb. Roller Gauge.....
₱ doz. $6.75@7.25
Stanley R. & L. Co.'s Butt & Babbet Gauge.....90&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....10&10&5%

Gimlets—

Nail, Metal, Assorted.gro. $1.40@1.75
Spike, Metal, Assorted gro. $3.00@3.50
Nail, Wood Handled, Assorted. gro. $4.00@4.25
Spike, Wood Handled, Assorted gro. $5.00@5.25

Glass, American Window

Jobbers' List, Jan. 21, 1901.

Less than Carloads.....80&20%
Carloads.....85&5%
2000 Boxes.....87½

Glue—Liquid, Fish—

List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts.)..... 33⅓@48%
List C, Cans (½ gal., gal.) ....25@45%
International Glue Co. (Martin's)..... 40&10@50%

Glue Pots—See *Pots, Glue.*

Grease, Axle—

Common Grade.....*gro.* $5.00@6.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Dixon's Everlasting, in bxs..₱ doz. 1 ℔ $1.20; 2 ℔ $2.00

Snow Flake:
1 qt. cans..per doz. $2.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 10%

Grindstones—

Pike Mfg. Co:
Improved Family Grindstones, per inch, per doz.. ..... $2.00
Pike Mowe Knife and Tool Grinder, each..... $8.00 } 85&5%
Velox Ball Bearing, mounted, Angle Iron Frames .... each, $3.50

Guards, Snow—

Cleveland Wire Spring Co.:
Galv. Steel ₱ 1000.....$9.00
Copper ₱ 1000.....$18.00

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—

gro.
Peg Patent, Leather Top..$4.90@5.25
Peg Patent, Plain Top....$3.50@3.75
Sewing, Brass Ferrule.....$1.50@1.60
Saddlers', Brass Ferrule..$1.35@1.45
Pey, Common.....$1.35@1.35
Brad, Common.....$1.50@1.75

Halters and Ties—

Covert Mfg. Co.:
Web.....45&2%
Jute Rope.....45&2%
Sisal Rope.....50&2%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters.....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties..70%
Sisal Rope Ties.....60&20%

Hammers—

Handled Hammers—

Heller's Machinists'.....50@50&5%
Heller's Farriers.....50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40&10%
Peck, Stow & Wilcox.....40@40&10%
Fayette R. Plumb:
Plumb, A. E. Nail.....40&10&7½%
Engineers' and B. S. Hand..d0&10&2½%
Machinists' Hammers.....60%
Riveting and Tinners'.....40&10&7½%
Sargent's C. S. New List.....45&10%

Heavy Hammers and Sledges—

3 lb. and under...*lb.* 45*c*
3 to 5 lb.....*lb.* 36*c* } 80&10@80
Over 5 lb.....*lb.* 30*c* } &10&5%
Wilkinson's Smiths'.....8½*c*@10*c lb*

Handcuffs and Leg Irons

See *Police Goods.*

Handles—

Agricultural Tool Handles—

Axe, Pick, &c.....60@60&10%
Hoe Rake, Fork, &c.....60@60&10%
Shovel, &c., Wood D Handle.50@50&5%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted.....*gro.* $3.30@3.50
Brad Awl.....*gro.* $1.25@1.50
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.25@$2.35; large, $2.50@$2.60.
Hickory Tanged Firmer, gro. ass'd $1.75@$2.20; large, $3.50@$3.70.
Apple Socket Firmer, gro. ass'd, $1.70@$1.85; large, $2.00@$2.25
Hickory Socket Firmer, gro ass'd, $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing,gro.ass'd. $2.50@$2.75; large, $2.65@$2.85
File, assorted.....*gro.* $1.60@$1.15
Hammer, Hatchet, Axe, &c.....60%
Hand Saw, Varnished, doz. 70@75c
Not Varnished.....55@60c
Plane Handles:
Jack, doz.25c; Jack Bolted..55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c

Hangers—

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Doz	$0.85	1.30	1.60	1.95	2.45

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch	3	4	5	6
Doz	$1.45	1.90	2.55	3.10

Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Cronk Hanger Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.25
Parlor, New Model.....$2.75
Parlor New Champion.....$2.25
Barn Door, Standard.....60&10%
Covered.....50&10&10&5%
Special.....60&10%
Lawrence Bros.:
Advance.....60%
Cleveland.....70%
Crown.....60%
New York.....60%
Peerless.....60&10%
Sterling.....60%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Stowell Mfg. and Foundry Co..
Acme Parlor Ball Bearing.....40%
Atlas.....50&10%
Badger Barn Door.....50%
Baggage Car Door.....50%
Climax Anti-Friction.....50%
Elevator.....40%
Express.....50%
Interstate.....50&10%
Lundy Parlor Door.....50%
Matchless.....50&10%
Nansen.....60&10%
Stowell Parlor Door.....50%
Railroad.....50%
Street Car Door.....50%
Steel, Nos. 300, 404, 500.....40&15%
Wild West.....50%
Zenith fox Wood Track.....50%
Taylor & Boggs Foundry Co.:
Kidder's.....50@50&10%
Van Wagoner & Williams Hdw Co.:
American Trackless.....33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L.T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing....40%
Wilcox Auditorium Ball Bearing.20%
Wilcox Barn Trolley No. 123.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox Trolley Ball Bearing....40%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—

McKinney's Perfect Hasp ₱ doz..... 50
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—

Best Brands.....*50@50c&10%*
Cheaper Brands.....*60@60&10%*
Note.—Net prices often made.

Hay and Straw Knives—See *Knives.*

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind:
(Victor; National; 188; O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No	1	3	5
Doz. pair	$0.75	1.45	2.90

Mortise Shutter:
(L. & P., O. S., Dixie, &c.)

No	1	1½	2	2½
Doz. pair	$0.60	.55	.52	.45

Mortise Reversible Shutter, (Buffalo, &c.)

No	1	1½	2
Doz. pair	$0.65	.60	.55

Parker.....70@75%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5.....66⅔&10%
Sargent's, Nos. 11 & 12.....70&10%
Wrightsville H'dware Co.:
O. S, Lull & Porter.....80&2½%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Stenger's Positive Locking, Nos. 1 & 3.....70&10&5%
Shepard's Noiseless, Nos. 60, 65, 55.....70&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&7½%
1888, Old Pat'n. Nos. 1, 1 & 5.....75&7½%
Tip Pat'n, Nos. 1, 3 & .....75&7½%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&7½%
Shepard's Double Locking, Nos. 30 & 25.....70&10%
Champion Gravity Locking, No. 75.....75&7½%
Steamboat Gravity Locking, No. 10.....5&7½%
Pioneer, Nos. 000, 45 & 55½.....75&7½%
Empire, Nos. 101 & 103.....70&7½%
W. H. Co.'s Mortise Gravity Locking, No. 2.....80&10%
Stanley's Steel Gravity Blind Hinges, ₱ doz. sets $1.30.....30&10%

Gate Hinges—

Clark's or Shepard's—oz. sets:

No	1	2	3
Hinges with Latches	$1.90	2.50	3.85
Hinges only	1.30	1.90	2.90
Latches only	0.65	0.65	0.95

New England:
With Latch.....doz ....@$1.55
Without Latch.....doz. ....@$1.25
Reversible Self-Closing:
With Latch.....doz. ....@$1.80
Without Latch.....doz. ....@$1.45
Western:
With Latch.....doz. $1.40@1.75
Without Latch.....doz. $0.95@1.90
Wrightsville H'dware Co.:
Shepard's or Clark's, Nos. 1 & 2..65&2½%
Shepard's or Clark's, No. 3.....55&5%

Extra 10% often given on most of these Hinges.

Spring Hinges—

Holdback, Cast Iron..gro. $3.00@3.25
Non-Holdback, Cast Iron..... *gro.* $6.75@7.25
J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer's.....33⅓%
Chicago Spring Butt Co.:
Chicago.....25%
Floor Hinge.....50%
Garden City Engine House.....25%
Keene's Saloon Door.....25%
Triple End.....50%
Hoffman Hinge & Foundry Co.:
No.70 & 80 Holdback Detachable $8.50
Lawson Mfg. Co.:
Matchless.....30%
Matchless Pivot.....35%
Payson Mfg. Co.:
Oblique.....50&10%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₱ gr. $12.50
Ideal, No. 4.....₱ gr. $9.00
New Idea No. 1.....₱ gr. $9.00
New Idea, Double Acting.....45%
Van Wagoner & Williams Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....20%
American.....30%
Columbia, No. 14.....₱ gr. $9.00
Columbia, No. 18.....₱ gr. $25.00
Columbia, Adjustable.....30%
Gem, new list.....25%
Clover Leaf.....₱ gr. $12.50
Oxford new list.....25%

Wrought Iron Hinges—

Strap and T Hinges, &c., list Mar. 15, 1901:
Light Strap Hinges....75%
Heavy Strap Hinges..80%
Light T Hinges.....70%
Heavy T Hinges.....66⅔%
Extra Heavy T Hinges.. 75&10% } Extra 20@...%
Hinge Hasps.....60%
Cor. Heavy Strap.....80%
Cor. Ex. Heavy T...75&10%

Screw Hook and Strap.
6 to 12 in.....*lb.* 3 *c*
14 to 20 in.....*lb.* 2½*c*
22 to 36 in.....*lb.* 2½*c*

Screw Hook and Eye:
¾ to 1 inch.....*lb.* 5 *c*
⅝-inch.....*lb.* 6 *c*
½-inch.....*lb.* 7 *c*

Miscellaneous—

Hoffman's Steel Spring Butt Hinges.....40&10%
Hoffman's Offset Refrigerator Hinges..40&10%

Hods, Coal—

	15 inch.	*16 inch.*	*17 inch.*	*18 inch.*	
Galv. Open	$2 10	2.55	2.80	3.15	₱ doz.
Jap. Open	$1.60	1.92	2.10	2.40	₱ doz.
Galv. Funnel	2.65	3.05	3.32	3.65	₱ doz.
Jap. Funnel	$2.10	2.45	2.65	2.90	₱ doz.

Hoes—Eye—

Scovil and Oval Pattern.....*60&5@60&10&5%*
Grub, list Feb. 23, 1899, 70&5@70&10%
D. & H. Scovil.....35%

Handled—

Sept. 1, 1900, List:
Field and Garden.....*75&2%*
Ladies', Boys', Toy and Onion.....*70&10&10%*
Street and Mortar.....*75&7½&2%*
Cotton.....*70&10&10&5&2%*
Planters'.....*70&30%*
Weeding.....*75%*
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe.....75&2%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10&2%
Ft. Madison Mattock Hoes:
Regular Weight.....₱ doz. $4.50
Junior Size.....₱ doz. $4.00
Ft. Madison Sprouting Hoe, ₱ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy, per doz....75&2%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2%
B. B. Cultivator Hoe.....75&10%
Acme Weeding.....75&10%
W. & C. Lightning Shuffle Hoe, ₱ doz. $5.50

Hog Rings and Ringers—See *Rings and Ringers.*

Hoisting Apparatus—See *Machines, Hoisting.*

Hollow Ware—See *Ware, Hollow.*

Holders—Bit—

Angular, ₱ doz. $24.00.....45&10%

Door—

Empire.....50%

File and Tool—

C. E Jennings & Co. Model Tool Holders.....33⅓%
Nicholson File Holders and File Handles.....33⅓%

Hooks—Cast Iron—

Bird Cage, Reading..... } 50&10@60%
Bird Cage, Sargent's List... }
Clothes Line, Hoffman's.....40&10%
Clothes Line, Sargent's List50&10&5&10%
Ceiling, Sargent's List.....40&10%
Clothes Line, Stowell's.....70%
Clothes Line, Reading List 65&10@65&10&10%
Coat and Hat, Stowell's.....70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Sargent's List.....45&10%
Coat and Hat, Wrightsville .....65&10%
Harness, Reading List.....70&10@75%

Wire—

Belt.....80%
Wire C. & H. Hooks..60&10@60&10&5%
Atlas, Coat and Hat:
Single Cases.....45%
10 Case Lots.....45&10%
Czar Harness.....50&10&5%
Wire Coat and Hat:
Acme.....60%
B. B.....60%
V Brace, Chief and Czar.....60%
Gem.....60%
Bright Wire Goods—See *Wire.*

Wrought Iron—

Box, 6 in., per doz. $1.50; 8 in., $1.75; 10 in., $2.00.
Cotton.....*doz.* $1.05@1.25
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—

Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass.....*Nos.* 1 2 3 4
Best..... .... $1.50 1.75 2.00
Common.. .. $1.30 1.30 1.40 1.60
Potato and Manure.....70%
Whiffletree.....*lb.* 4¾*c*
Hooks and Eyes:
Brass.....60*c*10*c*10@70%
Malleable Iron.....70*c*5@70*c*10%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—*See Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—See *Shoes, Horse.*

Hose Rubber—

Garden Hose, ¾-inch:
Competition.....*ft.* 4¼@ 4¾*c*
3-ply Standard.....*ft.* 5 @ 6 *c*
4-ply Standard.....*ft.* 8 @ 9 *c*
3-ply extra.....*ft.* 9 @10 *c*
4-ply extra.....*ft.* 11 @12 *c*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft.* 6 @7 *c*
Fair quality.....*ft.* 8 @9 *c*

Irons—Sad—

From 4 to 10.....*lb* 3@3¼*c*
B. B. Sad Irons.....*lb.* 3½@4*c*
Chinese Laundry.....*lb.* 5@5½*c*
Chinese Sad.....*lb.* 3½@3¼*c*
Mrs. Potts', per set:

Nos.	50	55	60	65
	67@72*c*	65@69*c*	77@82*c*	71@79*c*

New England Pressing..*lb.*. 3½@3¼*c*

Soldering—

Soldering Coppers, 1 & 1½ lb., $1 @ 23c.; 2 lb., 19 @ 21c
Covert Mfg. Co.....20&2%
Smith & Hemenway Co's Sets.....75%

Pinking—

Pinking Irons.....*doz.* 50@60*c*

Jack Screws—See *Screws.*

Jacks, Wagon—

Covert Mfg. Co., Steel.....45&2%
Covert's Saddlery Works':
Daisy.....60&10%
Victor.....60&10%
Lockport.....40@40&10%
Lane's Steel.....33⅓&5%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Hay and Straw—See *Hay Knives.*

Corn—

Ft. Madison Cut-Easy, ₱ doz.....$3.25
Withington Acme, ₱ doz., $2.65; Deer, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....70&5@70&10%
Adjustable Handle.....25@33⅓%
Bradley's.....35%
Cantelo's Folding.....50@50&5%
C. E. Jennings & Co. Nos. 45, 46..40&10%
Jennings & Griffin.....66⅔&5%
Swan's.....70&10&2½%
Watrous.....25%
L. & I. J. White.....20&5@25%

Hay and Straw—

Lightning Pat'n...per doz $6.25@6.50
Iwan's Sickle Edge.....₱ doz. $10.00
Iwan's Serrated.....₱ doz., $11.00
Lightning, (Genuine).....$6.25@6.50
Maine.....₱ doz. $8.50

Mincing—

Buffalo.....₱ gro. $15.00

Miscellaneous—

Farriers'.....*doz* $2 00@3.00
Wostenholm's.....₱ d z. $3.00@3 25

Knobs—

Base, 2½-inch, Birch, or Maple. Rubber tip, gro.....$1.20@1.30
Carriage, Jap, all sizes..gro. 30@35*c*
Door, Mineral.....*doz.* 60@65*c*
Door, For. Jap'd.....*doz.* 65@70*c*
Door, For. Nickel....*doz.* $2.00@2.10
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's.....60&10%
Snow's Victor.....50&10%

Ladders, Step—

Handy Ladder Works:

Length. Feet.	Extended Length. Feet.	Shipped Ready for Use. Per doz.	Shipped K. D., Per doz.
4	7	$16.00	$14.00
5	9	19.50	17.00
6	11	24 50	21.00
7	13	29.50	25.00
8	15	34.00	29.00
9	17	39.00	32.00
10	19	43.00	35 00
11	21	46.50	40.00
12	23	51.00	45.00

Ladies— Melting—

L. & G. Mfg. Co. 60%
P., S. & W. ..... 40@40&10%
Reading ..... 50&10%
Sargent's ..... 40@40&10%

Lanterns— Tubular—

Regular Tubular ..... *doz. $4.50@5.00*
Side Lift Tubular ..... *doz. $4.75@5.25*
Square Lift Tubular ..... *doz. $4.75@5.25*
Other Styles ..... *40@10@40@10@5%*

Bull's Eye Police—

No. 1. 2¾ inch *$3.60*
No. 2, 3 inch *$4.00*

Latches, Thumb—

Roggin's Latches ..... *doz. 33@33c*

Lawn Mowers—

See *Mowers, Lawn.*

Leaders Cattle—

Small ..... *doz. 50c; large, 55c*
Covert Mfg. Co. ..... 45&2%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Solid Grip, Payson Mfg. Co. 80%
R. & E. 45%

Lines—

Wire Clothes, Nos...	*13*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*$1.80*	*1.70*	*1.30*

Ossawan Mills.
Crown Solid Braided Chalk..... 33⅓%
Mason's, No. 0 to No. 5 ..... 33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 8..... 40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gr. 30%

Locks— Cabinet—

Cabinet Locks ..... *33⅓@33⅓&7½%*

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]

Reading Hardware Co. 40%
R. & E. Mfg. Co. 50%
Sargent & Co. ..... 40@40&10%
Snow's Victor ..... 50&10%

Elevator—

Stowell's ..... 33⅓&%

Padlocks—

Wrought Iron ..... *80@80&10%*
R. & E. Mfg. Co. Wrt Steel and Brass. 50%

Sash, &c.—

Fitch's:
Bronze and Brass 66⅔%
Iron 70%
Ives' Patent.:
Bronze and Brass 62½%
Iron 65%
Wrought Bronze and Brass ..... 55&5%
Wrought Steel 60%
Payson's Signal 80%
Reading ..... 66&10&10@70%

Machines— Boring—

	Without Augers. Upright.	Angular.
Improved No. 3...	$4.25	No. 1 $5.00
Improved No. 4...	3.75	No. 2 3.38
Improved No. 5...	2.75	
Jennings'...	2.50	3.00
Millers' Falls...		5.75
Snell's, Rice's Pat.	2.50	2.75
Swan's, No. 500..	5.10	No. 800 6.45

Hoisting—

Moore's Anti-Friction Differential Pulley Block 30%
Moore's Hand Hoist, with Lock Brake. 20%
Moore's Portable Pneumatic Hoist.... 35%

Ice Cutting—

Chandler's 15%

Washing—

Wayne American ..... ₩ doz. $28.00
Western Star, No. 2..... ₩ doz. 28.00
Western Star, No. 3..... ₩ doz 30.00
St. Louis, No. 41..... ₩ doz. 60.00

Mallets—

Hickory ..... *45&5@50%*
Lignumvitæ ..... *45&5@50%*
Tinners', Hickory and Applewood, doz. ..... *50@55c*

Mats—

Door—

Elastic Steel (W. G. Co.) 10%

Mattocks—

See *Picks and Mattocks.*

Meat Cutters—

See *Cutters, Meat.*

Milk Cans—See *Cans, Milk*

Mills— Coffee—

Enterprise Mfg. Co. ..... 35@30%
National, list Jan. 1, '94 ..... 30%
Parker's Columbia and Victor@..... 50&10@60%
Parker's Box and Side..... 50&10@60%
Swift, Lane Bros. 30%

Mincing Knives—

see *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Net prices are generally quoted.
Cheap ..... *all sizes, $1.80@2.10*
Good ..... *all sizes, $2.50@2.75*

	10	*12*	*14*	*16-inch*
High Grade	*4.25*	*4.50*	*4.75*	*5.00*

Pennsylvania and Continental. 60&10&5%
Quaker City ..... 70&5%
Great American ..... 70&5%
Philadelphia:
Styles M., S., C., K., T. ..... 70&5%
Style A, all Steel ..... 65&10%
Style E, Low Wheel ..... 60&10%
Style E, High Wheel ..... 70&10&5%
Drexel and Gold Coin, low list... 50&5%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899. ..... *85@85&10%*
Hungarian, Finishing, Upholsterers', &c. See Tacks.

Horse—

Nos.	6	7	8	9	10	
A. C.	25¢	23¢	22¢	21¢	21¢	40&5%
Ausable	28¢	24¢	25¢	24¢	23¢	50&10%
Capewell	19¢	18¢	17¢	16¢	16¢	10&5%
C. B. K.	25¢	25¢	22¢	21¢	21¢	40%
Champ'n	28¢	26¢	25¢	24¢	23¢	40&10&5%
Clinton	19¢	17¢	16¢	15¢	14¢	50&10&5%
Maud S.	25¢	23¢	22¢	21¢	21¢	50%
Neponset	28¢	21¢	20¢	19¢	18¢	40%
Putnam	23¢	21¢	20¢	19¢	18¢	33⅓%
Vulcan	23¢	21¢	20¢	19¢	18¢	25&10%

American Nos. 1 to 10 ₩ lb. ..... 9@9½¢
Jobbers' special brands... per lb. 8@9c

Picture

	1¼	*2*	*2½*	*3*	*3½ in.*
Brass Head.	*.45*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head...	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Nippers, See *Pliers and Nippers.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—

Cold Punched ..... *Off*
Mfrs. or U. S. Standard. ..... *list.*
Hexagon, plain *5.80c*
Square, plain *5.40c*
Square, C. T. & R. *5.60c*
Hexagon, C. T. & R. *6.30c*

Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square Blank or Tapped *5 60c*
Hexagon Blank or Tap'd *6.30c*

Oakum—

Best or Government ..... *lb. 6¼c*
Navy ..... *lb. 5 c*
U. S. Navy ..... *lb. 5½c*
Plumbers' Spun Oakum *8¾c*
In carload lots ¼c lb. off f.o.b. New York.

Oil, Axle—

Snow Flake:
1 pt. cans, per doz. $3.00
1 qt. cans, per doz. $4.80
1 gal. cans, per doz. $15 00
5 gal. cans, per doz. $66.00
} 33⅓&10%

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper ..... *40&10@50%*
Tin or Steel ..... *60¢10@65%*
Zinc ..... *60¢10@65%*
Paragon:
Brass and Copper ..... *40¢10%*
Tin or Steel ..... *60¢10%*
Zinc ..... *60¢10%*

Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₩ doz. 2lb;
Malleable, Hammers' Old Pattern, same list ..... 50&10%
Wilmot & Hobbs Mfg. Co:
Spring Bottom Cans ..... 70@70&10%
Railroad Oilers etc. ..... 60@60&10%

Openers—Can—

French ..... *doz 35c*
Iron Handle ..... *doz. 25@37c*
Sprague, Iron Hdle.. per doz. 35@40c
Sardine Scissors... doz. $1.75@$3.00
Tip Top ..... per doz. $0.7[illegible]
National, ₩ gro. ..... $1.75@$2.00
Stowell's ..... per doz. 40@45c
Waldorf, ₩ gro. $9.00

Egg—

Nickel Plate ..... per doz., $2.25
Silver Plate ..... per doz., $3.50

Packing—

Rubber—

Sheet, C. I. ..... *8@12½*
Sheet, C. O. S. ..... *9@15%*
Sheet, C. B. S. ..... *10@14½*
Sheet, Pure Gum ..... *60@70%*
Sheet, Red ..... *35@40%*
Jenkins' Standard, ₩ ₤ 80s.... 35@25&5%

Miscellaneous—

American Packing ..... *9@10c lb.*
Cotton Packing ..... *13@14c lb.*
Italian Packing ..... *10½@11½c lb.*
Jute ..... *5½@5c lb.*
Russia Packing ..... *12@13c lb.*

Pails—

Creamery—

S. S. & Co., with gauges.. No 1 $0.50; No. 2, $0.75 ₩ doz.

Galvanized—

Price per gro.

Quart.	*10*	*12*	*14*
Water, Regular	*13.00*	*$1.00*	*$4.00*
Water, Heavy	*$4.00*	*$7.00*	*$0.00*
Fire, Rd. Bottom.	*$1.00*	*$3.00*	*$5.00*
Well	*$7.00*	*$9.00*	*$1.00*

Pans—Dripping—

Standard List. ..... *60c5@60&10&5%*

Fry—

Common Lipped:

No.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.60*	*.75*	*.85*	*.95*	*1.15*

Roasting and Baking—

Regal, S. S. & Co., ₩ doz., Nos. 5, $4.50; 10 $5.00; 20 $5.50; 30, $6.00
Simplex, ₩ gro., No. 40 $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37 50; 160, $43.00.

Paper—Building Paper—

	Per roll
Rosin Sized Sheathing:	*500 sq. ft.*
Light wt., 20 lbs. to roll	*$0.32*
Medium wt., 30 lbs. to roll	*$0.47*
Heavy wt., 40 lbs. to roll	*$0.58*
Medium Grades Water Proof Sheathing	*$0.65@1.25*
Deafening Felt, 2, 6 and 12½ sq. ft. to lb., ton	*$36.00@37.00*
Red Rope Roofing, 250 sq. feet per roll	*$1.65*

Tarred Paper.

1 ply (roll 300 sq.ft.), ton.. $26 00@27.00
2 ply, roll 108 sq. ft. *50c*
3 ply, roll 108 sq. ft. *70c*
Slater's Felt (roll 500 sq. ft.).. *50@60c*
R. R. M. Stone Surfaced Roofing (roll 110 s. ft.) $2.75

Sand and Emery—

List Dec. 22, 1899.. 50&10@50&10&10%

Parers—

Apple—

Advance ..... ₩ doz. $4.50
Baldwin ..... ₩ doz. $5.00
Bonanza ..... each $5.00
Dandy ..... each $7.50
Eureka, 1898 ..... each $16.00
Family Bay State ..... ₩ doz. $12.00
Hudson's Little Star ..... ₩ doz. $4.00
Hudson's Rocking Table.... ₩ doz. $5.50
Improved Bay State ₩ doz. $27.00@30.00
New Lightning ..... ₩ doz. $5.50
Reading 72 ..... ₩ doz. $4.00
Reading 78 ..... ₩ doz. $7.00
Turn Table '98 ..... ₩ doz. $5.50
White Mountain ..... ₩ doz. $4.00

Potato—

Saratoga ..... ₩ doz. $5.50
White Mountain ..... ₩ doz. $4.50

Paris Green— *per lb.*

In Arsenic kegs or casks *12½c*
In kegs, 100 to 175 lbs. ..... *13 c*
In kits, 14, 28, 56 lbs. ..... *14 c*
In paper boxes, 2 to 5 lbs. ..... *14 c*
In paper boxes, 1 lb. *14½c*
In paper boxes, ½ lb. *15½c*
In paper boxes, ¼ lb. *16½c*

Picks and Mattocks—

List Feb. 28, 1899.... 70c&10@70c&10c&5%

Pinking Irons—

See *Irons, Pinking.*

Pins—

Escutcheon—

Brass *60%*
Iron, list Nov. 11, '85. ..... *60%*

Pipe, Cast Iron Soil—

Factory Shipments—Carload lots.

Standard, 2-6 in. *65c5%*
Extra Heavy, 2-6 in. ..... *70&10%*
Fittings ..... *75c10&5%*
NOTE.—*Freight allowed on Carload lots.*

Pipe, Merchant, Boiler Tubes, &c.—

Carloads to Consumers.

Merchant Pipe.

	Black.	*Galvanized*
⅛ to ⅛ inch	*61%*	*48%*
¾ to 10 inch	*68½%*	*56%*

Boiler Tubes

Steel.	*Up to 22 feet.*
1 to 1¾ inch and 2¼ to 5 inch inclusive	*65½%*
2 to 2¼ inch, inclusive	*60%*
6 to 10 inches	*59%*
Iron.	
1 to 1¼ inch and 2½ in.	*43½%*
1¾ to 2¼ inch	*43%*
2¾ to 13 inch	*53%*
Casing, Cut Lengths.	*S. & S.*
2 to 3 inch	*53½%*
3¼ to 6 inch	*59%*
7 to 12½ inch	*61½%*

NOTE.—*Prices to jobbers are from 5@7½% less than above.*

Planes and Plane Irons—Wood Planes—

Molding ..... *40c2½@40c10%*
Bench, first quality ..... *45c10@45c10c5%*
Bench, second quality ..... *50c10@50c10c5%*
Bailey's (Stanley R. & L. Co) ..... 50&10@50&10&10%
Gage Self Setting 35%

Iron Planes—

Bailey's (Stanley R. & L. Co) ..... 50&10@50&10&10%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10@25&10&10%
Sargent's ..... 50&10&10%

Plane Irons—

Wood Bench Plane Irons ..... *30c5@30c10c5%*
Buck Bros. 30%
Butcher's ..... $5.00@5.25 to 2
Stanley R. & L. Co... 50&10@50&10&10%
L. & L. J. White's ..... 20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse ..... ₩ doz. $9.00

Plates—

Felloe ..... *lb. 2¾@4c*
Self-Sealing Pie Plates (S. S. & Co.), ₩ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... *70c10@75%*
Gas Burner, per doz., 5 in., $1.15@ $1.20; 6 in., $1.35@$1.45
Gas Pipe.. 7 8 10 12-in.
$1.75 $2.00 $2.75 $3.75
Acme Nippers ..... 40@40&5%
Bernard's:
Parallel Pliers, &c. 35%
Paragon Pliers ..... 50&5%
Lodi Pliers ..... 50&5%
Elm City Fence Pliers 35%
Cronk Hanger Co.:
American Button ..... 75&10%
Cronk's 60%
Improved Button ..... 70&10%
Stub's Pattern 50%
Combination and others 35%
Heller's Parallel Nippers, Pincers and Tools 50&50&5%
P., S. & W. Cast Steel ..... 80&10@40%
P., S. & W. Tinners' Cutting Nippers. 40@40&5%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Plumbs and Levels ..... *75@75c10%*
Davis Iron, Machinist Nos. 1 to 14.... 30%
Davis Iron, Adjustable Nos. 6 to 49.... 35%
Disston's 70%
Pocket Levels ..... 75&10&10@75&10%
Stanley R. & L. Co ..... 70&10@70&10&10%
Stanley's Duplex..... 25&10@25&10&10%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50 ..... 50%

Points, Glaziers'—

Bulk and 1 lb. papers.. lb. 8 @ 8½c
½-lb. papers ..... *lb. 8½@ 8¾c*
¼-lb. papers ..... *lb. 8½@ 8¾c*

Pokes, Animal—

Ft. Madison Hawkeye ..... ₩ doz. $3.25
Ft. Madison, Western ..... ₩ doz. $3.75

Police Goods—

Manufacturers' Lists ..... *25@25&5%*
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ₩ doz. $3.00; No. 2 (1 qt.), $9.72 ..... 40%
Prestoline Paste ..... 33⅓@40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₩ doz. 50¢; ₩ gr. $4.50; ½ ₤ boxes, ₩ doz. $1.25; 1 ₤ boxes, ₩ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₩ doz. $1.25; ₩ gr. $12.00.
Barkeepers' Friend Metal Polish, ₩ doz. $1.75; ₩ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₩ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 ₤ cans ₩ ₤ 10¢
Black Eagle, Liquid, ½ pt. cans ₩ doz. 75¢
Black Jack Paste, ¾ ₤ cans, ₩ gro. $9.00
Ladd's Black Beauty, gr. $10.00..... 50%
Joseph Dixon's, ₩ gr. $5.75..... 10%
Dixon's Plumbago ..... ₩ ₤ 8¢
Fireside ..... ₩ gr. $2.50
Gem, ₩ gr. $4.50..... 10%
Japanese ..... ₩ gr. $3.50
Jet Black ..... ₩ gr. $3.50
Peerless Iron Enamel, ½ pt. cans ₩ doz. $1.50
Wynn's:
Black Silk, 5 ₤ pail..... each 70¢
Black Silk, ½ ₤ box..... ₩ doz. $1.00
Black Silk, 5 oz. box..... ₩ doz. $0.75
Black Silk, ½ pt. liq..... ₩ doz. $1.00

Poppers, Corn—

Round or Square:
1 qt. ..... *gro. $6.50@$7.00*
1½ qt. ..... *gro. 9 50@ 10.00*
2 qt. ..... *gro. 10.50@ 11.00*

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots— Glue—

Enameled *45%*
Tinned *40%*

Powder—

In Canisters:
Duck, 1 lb. each *15c*
Fine Sporting, 1 lb. each *75c*
Rifle, ½-lb. each *15c*
Rifle, 1-lb. each *25c*
In Kegs:
Duck, 6½-lb. kegs *$2.25*
Duck, 12½-lb. kegs *$4.25*
Duck, 25-lb kegs *$8.00*
Rifle, 6½-lb kegs *$1.25*
Rifle, 12½-lb. kegs *$2.25*
Rifle, 25-lb. kegs *$4.00*
King's Smokeless Shot Gun and Rifle: Keg (25 ₤ bulk) $22 00
Half Keg (12½ ₤ bulk) $11.25
Quarter Keg (6¼ ₤ bulk)..... $5.75
Canister (1 ₤ bulk) $1.00
} 20&2½&10%
King's Semi-Smokeless: Keg (25 ₤ bulk)..... $16.00
Half Keg (12½ ₤ bulk)..... $8.25
Quarter Keg (6¼ ₤ bulk)..... $3.75
One Pound Can, bulk..... $0.50
} 20@2½&10%

Presses—Fruit and Jelly—

Enterprise Mfg. Co. ..... 30@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Crown, ₩ doz. $18.00..... 50%
Crown Prince, ₩ doz. $15.00..... 50%
Cyclops ..... 40@40&10%
Diamond B, No. 2, doz. $22.; No. 3, $11 ..... 40%
Eureka, 5 ₤, doz., $16.00; 3 ₤ $15 ..... 40%
Giant, No. 1, ₩ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%
Miller's Falls, No. 3, per doz. $12.00 ..... 15&10%
Pelican ₩ doz. $9.00..... 40&10%
Scranton, No. 1 and 2, ₩ doz..... $9.00
Scranton, No. 3, ₩ doz..... $8.50

Pulleys—

Hay Fork, Swivel or Solid Eye ..... *doz. $1.35@1.50*
Hot House, Awning, &c..... 60@60&10%
Japanned Clothes Line..... 60@60&10%
Japanned Screw..... 70&10&10%
Japanned Side..... 70&10&10%
Stowell's Ceiling or End, Anti-Friction 60%
Stowell's Dumb Waiter, Anti-Friction ..... 60&10%
Hay Fork, Stowell's Anti-Friction, 5-in Wheel, ₩ doz. $12.00..... 40%
Stowell's Electric Light..... 60%
Stowell's Side, Anti-Friction..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz., 1¾ in., 15c.; 2 in., 17c
Auger Mortise, no Face Plate, per doz., 1¾ in., 15c.; 2 in., 18c.
Auger Mortise, with Face Plate, per doz., 1¾ in., 16c.; 2 in., 19c.

Acme.....1¾ in., 16¢; 2 in., 19¢
Common Sense, 1¾ in.... ₱ doz., 18¢; 2 in., 20¢.
Fox-All-Steel, Nos. 3 and 7, 2¼ in.....
₱ doz. 25¢
No. 9, 1¾ in..... ₱ doz. 20¢
Extra for Plated Finish....₱ doz. 20¢
Extra for Anti-Friction Bronze Bushing.....₱ doz 10¢
Grand Rapids All Steel Noiseless....40%
Ideal No. 13.....1¾ in., ₱ doz., 20¢
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy....1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See *Blocks.*

Pumps—

Cistern.....60¢&10@60¢&10¢&10%
Pitcher Spout.....80%
Pump Leathers, Lower and Plunger Valves—Per gro.:

Inch..	2	2¼	2½	2¾
	$2.20	*2.50*	*2.75*	*3.00*
Inch..	3	3¼	3½	3¾	4
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Barnes Dbl. Acting (low list).....55%
Flint & Walling's Fast Mail.....55&10%
Flint & Walling's Pitcher Spout....80&10%
Loud's Suction Pumps, U. d. Co.....20%
Myer's Pumps, low list.....50%
Contractors' Rubber Diaphragm Non-chokable, B. & L. Block Co.....80%

Punches—

Revolving (4 tubes)...doz. $5.50@$5.75
Saddlers' or Drive, good...doz. 65@70c
Spring, good quality.....*$1.65@1.75*
Bemis & Call Co.'s Cast Steel Drive....50%
Bemis & Call Co.'s Check.....55%
Bemis & Call Co.'s Spring.....50%
Niagara Hollow Punches.....45%
Niagara Solid Punches.....55%
Steel Screw, B & K. Mfg. Co.....40%
Tinners' Hollow, P., S. & W. Co.....
35@35&5%
Tinners' Solid, P., S. & W.Co., ₱ doz., $1.44.....55%

Rail—Barn Door, &c.—

Barn Door, Light..⅛ ⅝ ¾ ⅞ In.
100 feet.....*$3.00 $2.50 $3.00 $3.50*
B. D., for N. E. Hangers:

	Small.	*Med.*	*Large.*
100 feet.....	*$2.20*	*2.70*	*3.20*

Sliding Door, Bronzed Wr't Iron, ft. 6½¢
Sliding Door, Iron Painted....2¼@3c
Sliding Door, Wrought Brass, 1⅛ in. .....*lb. 36c*...50%
Cronk's Double Braced Steel Rail, ₱ foot.....3½¢
Cronk's O. N. T. Rail.....3½¢
Lanes' O. N. T., ₱ 100 ft., 1 inch....$2.65
Lanes' Standard, ₱ 100 ft.....3.75
Lawrence Bros.'.....₱ ft. 4¼¢
McKinney's None Better.....₱ ft. 3¾¢
McKinney's Standard.....₱ ft. 4 ¢
Stowell's Cast Rail.....1½¢
Stowell's Steel Rail, Plain.....2½
Stowell's Wrought Bracket, Plain....3½¢

Rakes—

Net Prices, Malleable Rakes:

	10	*12*	*14*	*16-tooth*
Shank.....	*$1.50*	*1.60*	*1.75*	*1.85*
Socket.....	*$1.65*	*1.80*	*1.95*	*2.10*

Sept. 1, 1900, List:
Cast Steel.....70¢&5¢&2%
Malleable.....70¢&10@75¢&5%
Lawn Rakes, Metal Head, per doz..
20 teeth.....*$3.25@3.50*
24 teeth.....*$3.60@3.75*
Fort Madison Red Head Lawn.....$3 25
Fort Madison Blue Head Lawn.....$3.00
Jackson Lawn, 20 and 30 teeth.....
₱ doz. $4.50
Kohler's:
Lawn Queen, 20-tooth, ₱ doz.....$3.60
Lawn Queen, 24-tooth, ₱ doz.....$3.75
Paragon, 20-tooth, ₱ doz.....$2.85
Paragon, 24-tooth, ₱ doz.....$3.00
Steel Garden, 14-tooth, ₱ doz.....$3.00
Malleable Garden, 14-tooth.....
₱ doz. $2.25

Rasps, Horse—

Disston's.....75%
Heller Bros.....60&10&10%
McCaffrey File Co. Horse Rasps.....
60&10&5%
New Nicholson Horse Rasp.....70&10%
See also *Files.*

Razors—

Fox Razors, No. 42...₱ doz. $20.00 } 40%
Fox Razors, No. 44...₱ doz. $24.00 }
Fox Razors, No. 52, Platina, ₱ doz. $24.00
Sterling Razor Works.....50%

Razor Strops—

See *Strops, Razor.*

Reels—Fishing—

Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Populo and Salmon, Single Action, Multiplying and Quadruple, all sizes.....25%
Hendryx Single Action Series, 102P and PN, 202P and PN, 102 PR and PRN, 202 PR and PRN, 304 P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor.50%
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2904N, 2904P and PN, 002904PN, 0924 and 0924N, 5009N and PN.....40&10%
Shakespeare, Style C.....25%

Registers—

Leading Sizes.
Black Jap.....60¢&10@...%
White Jap.....40¢&10@50%
Bronzed.....40¢&10@50%
Nickel Plated.....50¢&10@60%
Electro Plated.....40¢&10@50%
There is a good deal of irregularity in prices of Registers, and some very low quotations are current on Black Japanned.

Revolvers—

Single Action.....80@85c
Double Action.....$1.55
Automatic.....$1.75
Hammerless.....$3.25

Riddles, Grain or Sand—

16in. per doz.....*$2.00@$2.25*
17 in. per doz.....*$2.25@$2.50*
18 in. per doz.....*$2.50@$2.75*

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 Inch.*
Steel.....	*$0 80*	*0.90*	*0.95 doz.*
Copper.....	*1.10*	*1.80*	*1.50 doz.*

Hog Rings and Ringers—

Hill's Rings...gro. boxes, $4.50@4.75
Hill's Ringers, Gray Iron.doz. 55@60c
Hill's Ringers, Mal. Iron, per doz 75@80c
Blair's Rings.....*per gro. $5.75@6.00*
Blair's Ringers...*per doz. $0.65@ .70*
Brown's Rings....*per gro. $6.00@6.25*
Brown's Ringers..*per doz. $1.00@1.10*
Rapid Rings.....₱ gro. $6.00
Rapid Ringers.....₱ doz. $0.50

Rivets and Burrs—

Copper.....60@50¢&5%
Iron or Steel:
Tinners'.....70@70¢&10%
Miscellaneous.....70@70¢&10%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....50&10&10%
Cronk's Stay.....66⅔%
Cronk's Brinkerhoff.....66⅔%
Lane's, Stay.....33⅓%
Stowell's Barn Door Stay...₱ doz. $1.25

Rope—

Manila, 7-16 in. and larger.
lb. 10¼@10½c
Manila.....*¾-inch. lb. 11 @11½c*
Manila ¼ & 5-16 in. lb. 11¼@11½c
Manila, Tarred Rope, 15 thread.....*lb. 10½@10¼c*
Manila Hay Rope. Medium.....*lb 10½@10¼c*
Sisal, 7-16 in. and larger.....*lb. 7¼@ 7½c*
Sisal.....*¾-inch. lb. 7¾@ 8 c*
Sisal, ¼ and 5-16 in. lb. 8¼@ 8½c
Sisal, Hay Rope, 2 to 10 ply.....*lb. 7¼@ 7½c*
Sisal, Tarred, Medium Lath Yarn.....*lb. 6¾@ 7 c*
Cotton Rope:
Best...¼-in. and larger lb. 14 c
Midium, ¼-in. and larger lb. 11½c
Com., ¼-in. and larger lb. 9 c
Jute Rope, No. 1, ¼ in. and up.....*lb. 6½c*
Jute Rope, No. 2, ¼-in. and up.....*lb. 6 c*

Prices in good lots.

Wire Rope—

Galvanized.....85¢&7½&%
Plain.....80¢&7½&%

Ropes, Hammock—

Covert Mfg. Co.....45&2%
Covert Saddlery Works.....60&8%

Rules—

Boxwood..75¢&10¢&10¢&10¢&10¢&75¢&10¢&10¢&10¢&10¢&5%
Ivory...40¢&10¢&10¢&40¢&10¢&10¢&10¢&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....50&10%
Stanley R. & L. Co.:
Boxwood...75&10&10&75&10&10&10%
Ivory.....35&10@35&10&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cords—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins:
Circular.....50@50&10%
Band.....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50&10%
One-Man Saw.....40%
Wood Saws.....40%
Hand, Compass, &c.....40%
Disston's:
Circular Solid and Inserted Tooth.50%
Band 2 to 14 in. wide.....60%
Band ¼ to 1¾.....70%
Crosscuts.....@45&10%
Narrow Crosscuts.....50@50&10%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35@35&7½%
Woodsaw Blades.....40@40&7½%
Woodsaw Rods.....25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8.....25@25&7½%
Hand Saws, Nos 7, 107, 107½, 3, 1, 0, 00, Combination.....30@30&7½%
Compass Keynole, &c.....25@25&7½%
Butcher Saws and Blades..35@35&7½%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....35%
Compass and Key Hole Saws.....25%
Framed Wood Saws.....40%
Hand Saws.....35@30%
Wood Saw Blades.....45%
Peace:
Circular and Mill.....50%
Cross Cuts, list Jan. 1, '99.....50%
Hand, Panel and Rip.....30%
Richardson:
Circular and Mill.....50%
Hand, &c.....30%
X Cuts, list Jan. 1, '99.....50%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws..50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Compass, Keyhole, &tc.....25@25&7½%
Wood Saws.....35@35&7½%

Hack Saws—

Disston:
Concave Blades.....25%
Keystone.....30%
Hack Saw Frames.....30%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180, 330.....40%
Hack Saws, Nos. 175, 180, 330, complete.....40%
Griffin's Hack Saw Frames.....45%
Griffin's Hack Saw Blades.....45%
Star Hack Saws and Blades.....15&10%

Scroll—

Barnes' No. 7, $15.....25%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scale Beams—

See *Beams, Scale.*

Scales—

Family, Turnbull's.....30@30&10%
Counter:
Hatch, Platform, ¼ oz to 4 lbs. doz $5.50
Two Platforms, ½ oz to 8 lbs. doz. $16.00
Union Platform, Plain..$1.70@1.90
Union Platform, Striped $1.85@2.15
Chatillon's:
Eureka.....25%
Favorite.....40%
Grocers' Trip Scales.....50%
Pelouze Scales—Household, Counter, Confectionery, Postal, Ice, &c.....20%
"The Standard" Portables.....40%
"The Standard" R. R. and Wagon....50%

Scrapers—

Box, 1 Handle.....*doz $2.25@2.50*
Box, 2 Handle.....*doz. $5.75@4.00*
Ship, No. 1, doz. $3.50; No 2, $2.25@2.40
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&10%

Screens, Window and Frames—

Bonanza Window Screens.....60@60&5%
Flyer Pattern Window Screen.60@60&5%
Maine Window Screen Frames.40&10&5%
Perfection Window Screens.....60@60&5%
Phillips' Window Screen Frames.....
60&10&5%
Porter's Hummer Window Screens..
60@60&5%
Porter's Klondike Window Screens.....
60&2½@60&7½%
Wabash Spring Adj. Screen.....50%

Screw Drivers—

See *Drivers, Screw.*

Screws—

Bench and Hand—

Bench, Iron..doz. 1 in., $3.00@3.25; 1¼, $3.50@3.75; 1¼, $4.00@4.50
Bench, Wood, Beech..doz. $3.50@2.75
Hand, Wood.....*30&5@40%*
Hand, R. Bliss Mfg Co.....35%

Coach, Lag and Hand Rail—

Lag, Common Point, list Oct. 1, '99.....*75&15@...%*
Coach and Lag, Gimlet Point, list Oct. 1, '99.....*75&10@...%*
Hand Rail, list Jan. 1, '81.60&10@...%

Jack Screws—

Standard List.....75@75&10%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....40&5@40&10%
Sargent.....70&10%

Machine—

List Jan. 1, '98.
Flat or Round Head, Iron.50&10@60%
Flat or Round Head, Brass.....
50&10@60%

Set and Cap—

Set (Iron or Steel).....70&10%
Sq. Hd. Cap.....65&10%
Hex. Hd. Cap.....65&10%

Wood—

List Jan. 1, 1900.
Manufacturers' printed discounts:
Flat Head, Iron.....87½@90%
Round Head, Iron.....85@87½%
Flat Head, Brass.....85@87½%
Round Head, Brass.....82½@85%
Flat Head, Bronze.....75@80%
Round Head, Bronze.....72½@77½%
Drive Screws.....87½@90%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grass Scythes:
Natural Finish.....*per doz. $7.25*
Polished Blade.....*per doz. $7.75*
Painted or Bronzed..per doz. $7.50
Weed and Bush..per doz. $7.25@7.50

Scythe Snaths—

See *Snaths, Scythe.*

Seeders—Raisin—

Enterprise.....25@30%

Sets—

Awl and Tool—

Brad Awl and Tool Sets:
Wood Hdle., 10 Awls doz. $2.00@2.25
Wood Hdle., 14 Awls, 6 Tools.... doz. $2.50@2.60
Aiken's Sets, Awl and Tools:
No. 20, ₱ doz. $10.00.....50&10&10%
Fray's Adj. Tool H dls...Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
Millers Falls Adj. Tool H'dls, No. 1, $19; No. 4, $12; No. 5, $18.....15&10%
Stanley's Excelsior:
No. 1, $7.50; No. 2 $4.00; No. 3, $5.50.....30&10&30&10&10%

Garden Tool Sets—

Ft. Madison Rakes, Shovel and Hoe.....
₱ doz.....$9.00

Nail—

Square.....*per gro. $2 50*
Round, Blk. and Pol., assorted.... gro. $1.80@2.50
Octagon.....*gro. $4.25@4.75*
Knurled. Good.....*gro. $6.00@6.50*
Buck Brothers.....37½%
Cannon's Diamond Point, ₱ gr. $12...25%
Mayher's.....per gro. $9.00
Snell's Corrugated, Cup Pt.....50%
Snell's Knurled, Cup Pt.....66⅔%

Rivet—

Regular list.....70@70¢&10¢&5%

Saw—

Aiken's:
Genuine.....₱ doz. $5.50@6.00
Imitation.....₱ doz. $3.00@3.10
Atkin's.:
Criterion.....40%
Adjustable.....40%
Bemis & Call Co's.:
Cross Cut.....30%
Hammer, new Pat.....45%
Plate.....30%
Spring Hammer.....30%
Disston's Star and Monarch.....25%
Morrill's No. 1, $15.00.....40&20%
Nos. 3 and 4, Cross Cut, $23.00.....
50&20&5%
No. 5, Mill, $31.00.....50&30& 0%
No. 10, $15.50.....40&20%
No. 11, $16.00.....40&20%
Taintor Positive, ₱ doz. $18.....60%

Sharpeners Knife—

Chicago Wheel & Mfg. Co.....65%
Smith & Hemenway Co.....70&5%
Tanite Mills ₱ gross, $14.40....25@33⅓%

Sharpeners Skate—

Eureka Skate Sharpener.....₱ doz. $2.00

Shaves Spoke—

Iron.....*doz. $1 00@1 25*
Wood.....*doz. $1.75@2.00*
Bailey's (Stanley R. & L. Co.).....50&10%
Goodell's, ₱ doz. $9.00.....15&10%

Shears—

Cast Iron...	*7*	*8*	*9 in.*
Best.....	*$16.00*	*18.00*	*20.00 gro.*
Good.....	*$13.00*	*15.00*	*17 00 gro.*
Cheap....	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality, Jap.....70@70¢&10%
" Nickel.....60@60¢&10%
Fair qual. Jap.....80@80¢&5%
" Nickel.....75@75¢&10%
Tailors' Shears.....50@50¢&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailors' Shears.....40%
Wilkinson's Hedge.....50%
Wilkinson's Sheep.....1900 list, 50%

Tinners' Snips—

Steel Blades.....20¢&10%
Steel Laid Blades.....50¢&10%
Forged Handles, Steel Blades, Berlin.....40&10%
Jennings & Griffin Mfg. Co's. 7 to 10 inch.....50%
Niagara Snips.....40%

Pruning Shears and Tools—

Cronk's Grape Shears.....33⅓%
Cronk's Pruning Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ₱ doz. $18.00....25@25&10%
Disston's Pruning Hook, ₱ doz. $12.00.....25@25&10%
John T. Henry Mfg. Company Pruning Shears all grades.....50&5%
Orange Shears.....50&30%
Grape.....50&10%
Tree Pruners.....75%
Nagley's Pruning Shears.....10&5%
P., S. & W. Co.....33⅓@33⅓&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Patent Roller Hatfield's, Sargent's list.....80&10@80&10&7½%
Reading.....70&10@75%
R. & E. list.....33⅓%
Wrightsville, Hatfield Pattern.....80%

Sliding Shutter—

Reading list.....70&10@75%
R. & E. list.....33⅓%
Sargent's list.....50&16⅔&10%

Shells—

Shells, Empty—

Brass Shells, Empty:
First quality, all gauges.....60&5%
Climax, Club, Rival, 10 and 12 gauge.....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Smokeless 10, 12, 16 and 20 gauge, 33⅓&10%
Blue Rival, New Climax, Primrose Club, Yellow Rival, 10, 12, 16 and 20 gauge.....15%
Climax, Club, League, Rival, 14, 16 and 20 gauge ($7.50 list).....20&5%
Climax, Club, League, Rival 10 and 12 gauge.....25&5%
Defiance, High Base, New Victor, Nitro, Repeater, 10, 12, 16 and 20 gauge.....15%
Trap and Metal Lined, 10, 12, 16 and 20 gauge.....33⅓&10&5%

Shells, Loaded—

Loaded with Black Powder.....40¢&5%
Loaded with Nitro Powder.....
40¢10¢&10¢&5%

Shoes, Horse, Mule, &c.—

F. o. b., Pittsburg.
Iron.....*per keg $3.50*
Steel.....*per keg 3.25*
Burden's, all sizes, ₱ keg.....$3.60

Shot—

Drop, up to B, 25-lb. bag...$1.25@1.35
Drop, B and larger, per 25-lb. bag.. $1.30@1.60
Buck, 25-lb. bag.....*$1.50@1.60*
Chilled, 25 lb. bag.....*$1.30@1.35*
Dust Shot, 25 lb. bag.....*$1.50@2.11*
Tatham's Chilled.....$1.50
NOTE.—*There is some irregularity in prices and jobbers often undersell the manufacturers.*

Shovels and Spades—

No. 2, Polished, Sq. or Rd. Point, D or L Handle:

	A1, *1st Grade.*	*B2,* *2d Grade*
Plain Back....	*$10 50*	*$9 60*
Strap Back....	*9.50*	*9 00*
Cleveland Pat'n	*10.20*	*9.30*

	C3, *3d Grade.*	*D4,* *4th Grade*
Plain Back....	*$8.70*	*$8.10*
Strap Back....	*8.10*	*7.50*
Cleveland Pat'n	*8.40*	*7.80*

All other sizes add 30c doz.
Black deduct 30c doz.

Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers $0.50@1.00, and Common, Plain Back Shovels are generally sold by jobbers at $6.75.

Sieves and Sifters—

Hunter's Imitation...gro. $9.50@10.00
Buffalo Metallic Blued, S. S. & Co., ₩ gr.:
14&16 16&18 18&20
$12.90 $13.80 $15.00
Eclipse.....₩ gr. $9.35
Electric Light.....₩ gr. $10.80
Hunter's Genuine.....₩ gr. $12.50
Shaker (Barler's Pat.) Flour Sifters.
₩ doz., $2.00.....20%

Sieves, Tin Rim—

Per dozen.

Mesh	*14*	*16*	*18*	*20*
Black, full size	$0 95	.98	1.00	1.10
Plated, full size	$1.05	1.08	1.10	1.20
Black, scant	$0.78	.80	.83	

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested, doz.....$0.65@0.75
Mesh 20, Nested, doz.....75@ .85
Mesh 24, Nested, doz.....90@1.00

Sinks—

Cast Iron—

Standard list.....65@65&10%
NOTE.—*There is not entire uniformity in lists used by jobbers.*

Wrought Steel—

New Era, Galv'd and Enameled...70&5%
New Era, Painted.....50&10%
L. & G. Mfg. Co., Galvanized.....50%
L. & G. Mfg Co., Enameled.....50%

Skeins, Wagon—

Cast Iron.....70c&10@75&
Malleable Iron.....40c&10@50&
Steel.....40@40c&10%

Slates—

"D" Slates.....40c&10@50&
Unexcelled Noiseless Slates.60c&10c&10@60c&10@60c&10c&10c&10c&10%
Wire Bound.....35@40c&5%
Double Slates, add $1 case, net.

Slaw Cutters—See *Cutters.*

Slicers, Vegetable—

Sterling $2.00.....33⅓%

Snaps, Harness—

German.....40@40c&10%
Covert Mfg. Co.:
Derby.....35&2½
High Grade.....45&2½
Jockey.....40&2½
Trojan.....45&2½
Yankee.....35&2½
Yankee, Roller.....30&2½
Covert's Saddlery Works:
Crown.....60%
German.....60%
Model.....60%
Triumph.....60%
W. & E. T. Fitch Co.:
Bristol.....40&10%
Empire.....50&5%
German.....40%
National.....50&5%
Perfect.....45%
Clipper.....50&5%
Champion.....40%
Security.....40%
Victor.....60&5%
Oneida Community:
Solid Steel.....65@65&10%
Solid 3-wire.....65&10@65&10&10%
Sargent's Patent Guarded.....60%&10%

Snaths—

Scythe.....45c&5c&2½

Snips, Tinners'—See *Shears.*

Soldering Irons—

See *Irons, Soldering.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Silver Plated—

Good Quality.....60c&10@60c&10c&5%
Cheap.....60@60c&10%
International Silver Co.:
1847 Rogers Bros.....40&10%
Rogers & Bro., William Rogers Eagle Brand, and Rogers & Hamilton.50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%
Simeon L. & Geo. H. Rogers Co.:
Silver Plated Flat Ware.....60%
No. 77 Silver Plated Ware.....60&10%

Miscellaneous—

German Silver.....60c&10@60c&10c&10%
Simeon L. & Geo. H. Rogers Co.:
German or Nickel Silver, Special list 1&10%

Tinned Iron—

Teas.....per gro. 45@50c
Tables.....per gro. 90c@$1.00

Springs—

Door—

Gem (Coil).....20%
Star (Coil).....30%
Torrey's Rod, 39 in....₩ doz. $1.10@1.25
Victor (Coil).....50&10&10%

Carriage, Wagon, &c.

Factory Shipments.

1¼ in and wider...	*Blk.*	*Hf. Brt.*	*Brt.*	
	5½	*5¾*	*6*	*c lb*

Cliff's Bolster Springs.....35%
Cliff's Seat Springs.....₩ pair 55¢

Sprinklers, Lawn—

Enterprise.....25@30%
Philadelphia No. 1, ₩ doz. $12; No. 2, $15; No. 3, $24.....30%

Squares—

Nickel plated..... } *List Jan. 5, 1900*
Steel and Iron..... } .....*70c&10@75&5%*
Rosewood Hdl Try Square and T-Bevels .....60c&10c&10@70%
Iron Hdl. Try Squares and T-Bevels. 40c&10@40c&10c&10%
Diston's Try Sq. and T-Bevels.....60&10%
Winterbottom's Try and Miter.....50&10%

Squeezers—

Lemon—

Wood, Common, gro., No. 0, $5.25 @$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap.....doz. $2.00@2.75
Good Grade.....doz. $3.00@3.50
Tinned Iron.....doz. $0.75@1.25
Iron, Porcelain Lined doz. $2.90@3.25
Jennings' Star.....₩ doz. $1.85@1.90

Staples—

Barbed Blind.....lb. 7@7¼c
Electricians', Association list.....80c&10c&10c&10%
Fence Staples, same price as Barbed Wire. See Trade Report.
Poultry Netting. Staples....per lb..5¼@5¼c
Grand Crossing Tack Co.'s list....80&10%

Steels, Butchers'—

Dick's.....30%
Foster Bros'.....30%
C. & A. Hoffmann's.....40%

Steelyards.....25@25&10%

Stocks and Dies—

Blacksmiths'.....40@40&10%
Gardner Die Stocks No. 1.....50%
Gardner Die Stocks, larger sizes.....40%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25@30%
Curtis Reversible Ratchet Die Stock.25%

Stone—

Scythe Stones—

Chicago Wheel & Mfg. Co:
Gem Corundum, 10 inch, $3.00 per gro., 12 inch, $10.80
Pike Mfg. Co. 1901 list:
Black Diamond S. S....₩ gro. $12.00
Lamoille S. S.....₩ gro. $11.00
White Mountain S. S....₩ gro. $9.00
Green Mountain S. S....₩ gro. $6.00
Extra Indian Pond S. S.₩ gro. $7.50
No. 1 Indian Pond S. S..₩ gro. $7.00
No. 2 Indian Pond S. S..₩ gro. $4.50
Leader Red End S. S....₩ gro $4.50
Balance of 1901 list 33⅓%.

Oil Stones, &c.

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit....30%
Gem Corundum Axe, Single or Double Grit.....35%
Gem Corundum Slips.....35%
Gem Corundum Razor Hones.....33⅓
Pike Mfg. Co. 1901 list: ₩ ℔
Arkansas Stone, No. 1, 3 to 5½ in. $2.80
Arkansas Stone, No. 1, 5½ to 6 in. $3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita 4 to 8 in.....60¢
Rosy Red Washita, 4 to 8 in.....60¢
Washita Stone, Extra, 4 to 8 in..50¢
Washita Stone, No. 1, 4 to 8 in..40¢
Washita Stone, No. 2, 4 to 8 in..30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
India Oil Stones (entire list) 25%
Hindostan No. 1, Regular....₩ ℔ 8¢
Hindostan No. 1, Small.....₩ ℔ 10¢
Axe Stones (all kinds).....40%
Turkey Oil Stones, ex. 5 to 8 in. ₩ ℔ 80¢
Queer Creek Stones, 4 to 8 in.....30¢
Queer Creek Slips.....40¢
Sand Stone.....5¢
Belgian, German and Sway Razor Hones.....40%
Natural Grit Carving Knife Hones, ₩ doz.....$3.00
Quick Edge Pocket Knife Hones, ₩ doz.....$3.50
Mounted Kitchen Sand Stone, ₩ doz.....$1.50
Tanite Mills:
Emery Oil, ₩ doz. $5.00.....50@60%

Stoners—

Cherry—

Enterprise.....25@30%

Stops, Bench—

Millers Falls.....15&10%
Morrill's...₩ doz., No. 1, $10.00..50&20%
Morrill's, No. 2, $11.00.....50&10%

Stops, Window—

Ives' Patent.....35&5%
Wilcox, Steel, per doz., $6.00.....50%

Stove Boards—

See *Boards, Stove.*

Stove Polish—See *Polish, Stove.*

Strainers Pump—

Diamond Joe Pump Strainers..per doz. 75¢

Straps, Box—

Cary's Universal case lots.....20&10%

Stretchers, Carpet—

Cast Iron, Steel Points....doz. 55@65c
Socket.....doz. $1.75

Strops, Razor—

Smith & Hemenway Co.....70%

Stuffers, Sausage—

Miles' Challenge, ₩ doz. $20...50@50&5%
Enterprise Mfg. Co.....25@25&7½%
National Specialty Mfg. Co., list Jan. 1, '97.....30%

Tacks Brads, &c.—

List Jan. 15, '99.
Carpet Tacks, American 90c&30@....%
American Cut Tacks....90c&20@....%
Swedes Iron Tacks.....90c&30@....%
Swedes Upholsterers' Tacks..... 90c&40@....%
Gimp Tacks.....90c&40@....%
Lace Tacks.....90c&40@....%
Trimmers' Tacks.....90c&20@....%
Looking Glass Tacks.....70c&10%
Bill Posters' and Railroad Tack... 90c&30@....%
Hungarian Nails.....80c&15%
Common and Patent Brads.....80c&10%
Trunk and Clout Nails.....80c&10%
NOTE.—*The above prices are for Straight Weights.* An extra 5% is given Star Weights** and an extra 10c&5% on Standard Weights.****

Miscellaneous—

Double Point Tacks.....90c&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list.....50c&10@60%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.....30-gal. $3.20
Emerald, S. S. & Co.....50-gal., $4.00
Queen City S. S. & Co., 50-gal.....$3.50
Queen City S. S. & Co., 60-gal.....$4.25

Tapes, Measuring—

American Asses' Skin.....40c&10@50%
Patent Leather.....35@30c&5%
Steel.....40@40c&5%
Chesterman's.....35@25c&5%
Eddy's Steel.....40@40&5%
Eddy's Metallic.....33⅓@33⅓&5%
Keuffel & Esser Co., Steel and Metallic, Lower list, 1899.....35%
Lufkin's Steel.....33⅓@35%
Lufkin's Metallic.....30@30&5%

Thermometers—

Tin Case.....80c&10@80c&10c&5%

Ties, Bale—Steel.

Standard Wire.....50c&10c&5%

Ties, Wall—

Cleveland Wire Spring Co.:
Galv. Steel 5-32 x 6¼ in. ₩ 1000..$10.00
Galv. Steel 5-32 x 8½ in. ₩ 1000..$11.00
Galv. Steel 5-32 x 11¼ in. ₩ 1000.$12.00
Galv. Steel 5 32 x 15½ in. ₩ 1000.$14.00

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

L. & I. J. White.....20@20&5%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Game—

Oneida Pattern.....75c&5@75c&10c&5%
Newhouse.....45@45&5%
Hawley & Norton.....65&5@65&10%
Victor (Oneida Pattern).....75@75&5%
Star (Blake Pattern).....65&10@70&5%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes.... 5½@9c
Mouse, Round or Square Wire..... doz. $0.85@1.00
American Pattern French Rat and Mouse Traps—
No. 1, Detroit Marty Pattern, ₩ doz. $4.50; in ¼ gro. lots, ₩ doz.....$4.00
No. 2, Detroit Marty Pattern, ₩ doz. $3.25; in ¼ gro. lots, ₩ doz.....$3.00
Detroit Marty Pattern Mouse, ₩ doz. $2.00; in ¼ gro. lots, ₩ doz.....$1.75
Diamond Joe Mouse Traps....per doz. 60¢
Diamond Joe Rat Traps.....per doz. $1.00
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, Each $1.12½; ₩ doz. $12.00
No. 3, Rat, ₩ doz. $6.00; case of 50 $5.25 doz.
No. 3½, Rat, ₩ doz. $4.75; case of 72 $4.25 doz.
No. 4, Mouse, ₩ doz. $3.50; case of 72 $3.75 doz.
No. 5, Mouse, ₩ doz. $2.75;..case of 72 $2.25
Schuyler's Rat Killer, No. 1, ₩ gr. $30.00; No. 2, ₩ gr. $30.00; Mouse, No. 3, $18.00.....50%

Fly—

Balloon, Globe or Acme..... doz. $1.15@1.25; gro. $10.50@11.00
Harper, Champion or Paragon.... doz. $1.25@1.50; gro. $12.00@13 50

Trimmers, Spoke—

Bonney's Nos. 1 and 2.....40%

Trowels—

Diston Brick and Pointing.....30%
Diston Plastering.....25%
Diston "Standard Brand" and Garden Trowels.....40%
Never-Break Steel Garden Trowels.....gro. $7.00
Peace's Plastering.....30%
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....50%
Daisy Stove Trucks, Improved pattern ₩ doz. $21.00
Model Stove Trucks.....₩ doz. $18.50

Tubs, Wash—

	No. 1	*2*	*3*
Galvanized, per doz.	*$5.00*	*5 50*	*6.00*

Galvanized Wash Tubs (S. S. & Co.):

No.	1	2	3	10	20	30
Per doz.	$5 25	6.00	6.75	6.50	7 25	8.00

Twine—

Binder—

Small lots f. o. b. New York, Philadelphia or Boston,
White Sisal, 500 ft. to lb. per lb. 8@8¼c
Standard. 500 ft. to lb.. per lb. 8@8¼c
Manila, 600 ft. to lb.....per lb. 10@ 10¼c
Pure Manila, 650 ft. to lb. per lb. 11¼ @11½c
For carloads deduct ¼c per lb.

Miscellaneous—

Flax Twine—	*BC*	*B.*
No. 9, ¼ and ½-lb. Balls	*22c*	*24c*
No. 12, ¼ and ½-lb. balls	*18c*	*20c*
No. 15, ¼ and ½-lb. Balls	*16c*	*18c*
No. 24, ¼ and ½-lb. Balls	*15½c*	*17½c*
No. 36, ¼ and ½-lb. Balls	*15c*	*17c*

Chalk Line, Cotton, ½-lb. Balls..... 22@22½c
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....7@8c
Cotton Wrapping, 5 Balls to lb ... according to quality...10½c@17c
American 2-Ply Hemp, ¼ and ½-lb. Balls.....12@13c
American 3 Ply Hemp, 1-lb. Balls.. 12@13c
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....8½c
India 3-Ply Hemp, 1-lb. Balls.....8½c
India 3-Ply Hemp, 1½-lb. Balls.... 7c
2, 3, 4 and 5-Ply Jute, ½-lb. Balls... 9½@10c
Mason Line, Linen, ½-lb. Balls...45c
No. 24½ Mattress, ¼ and ½-lb. Balls.37c
Wool.....7c

Vises—

Solid Box.....50%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard.....40%
Amateur.....25%
Bonney's.....40%
Fisher & Norris Double Screw....15&10%
Hollands':
Machinists'.....40%
Keystone.....65&5%
Lewis Tool Co.....20@30%
Massey's Perfect.....15@20%
Massey's:
Clincher.....80@40%
Combination, Quick Adj.....40%
Woodworker's.....15@20%
Merrill's.....20%
Miller's Falls.....50&10&10%
Parker's:
Victor.....20@25%
Regulars.....20@25%
Vulcan's.....40@45%
Combination Pipe.....55@60%
Prentiss.....20@25%
Sargent's.....40%
Simpson's Adjustable.....40%
Snedfker's X. L.....20@25%
Stephens'.....20@25%
Van, W. & W. Hdw. Co.....40%

Saw Filers—

Bonney's, No. 1, $13; No. 3, $16 .....50%
Diston's D 9 Clamp and Guide, ₩ doz. $30.....25%
Reading.....40&10%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....30&10%

Miscellaneous—

Bignall & Keeler Combination Pipe Vise.....60%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—Price Per M.

B. E., 11 up	*60c*
B. E., 9 and 10	*70c*
B. E., 8	*80c*
B. E., 7	*80c*
P. E., 11 up	*$1.00*
P. E., 9 and 10	*1.25*
P. E., 8	*1.50*
P. E., 7	*1.50*

Dis. 30&5%

Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20.....$3 00@3.25

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Aluminum—

A. S. & Co. Reduced List.....40%

Cast Iron, Hollow—

Stove Hollow Ware:
Ground.....65%
Unground.....70%
White Enameled Ware:
Maslin Kettles.....75c&10c&5@80%
Covered Ware:
Tinned and Turned..... 40c&10@40c&10c&5%
Enameled and Plain.50@50c&10c&5%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware, list July '99..35%
Granite Ware, list Jan. 1, '94, revised Jan. 2, '95.....40&10%
Second Quality, Agate Nickel Steel..65%
Second Quality, Granite ..... 70&10@70&10&10%
Iron Clad Ware.....70&10%
Never Break Enameled....50&5@50&10%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45c*	*50c*	*55c*	*65c*

Steel Hollow Ware.

Avery Spiders & Griddles .....65@65&5%
Avery Kettles.....60%
Porcelained.....50&5@50&10%
Never Break Spiders and Griddles..... 65&5%
Never Break Kettles.....60%
Solid Steel Spiders & Griddles.....65&5%
Solid Steel Kettles.....60%
Solid Steel Ware, Enameled .....50&5%

Washboards—

Solid Zinc: ₩ doz
Crescent, family size, bent frame..$3.00
Red Star, laundry size, stationary protector.....$4.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.65
Wilson, family size, bent frame...$3.75
Single Zinc Surface:
Naiad protector, family size, open back peforated.....$2.40
Saginaw Globe, protector, family size, ventilated back.....$2.25
Wilson, bent frame family size, ventilated back.....$2 25

Washers—

Leather, Axle—

Solid..... .....85@85&10%
Patent.....85&10@85&10%
Coil: ⅛ 1 1¼ 1¾ Inch.
10c 11c 12c 18c per 100

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers....$5.20 4.30 3.00 2.30 2.00
In lots less than one keg add ¼c per lb., 5-lb. boxes add ½c to list.

Cast Washers—

Over ½ inch, barrel lots, per lb.....
1¼@1¾c

Washer Cutters—

See *Cutters, Washer.*

Washing Machines—

See *Machines, Washing.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Oil Finish.....lb. $.90@3.10c

Weights, Sash—

Per ton, f.o.b. factory....$19.00@22.50
Some Foundries make price $1@$2 lower.

Well Buckets, Galvanized

See *Pails, Galvanized.*

Wheels Well—

8-in., $1.65@1.75; 10-in., $2.00@2.10; 12-in., $2.50@2.75; 14-in., $4.25@4.40

Wire and Wire Goods—

Brt. and Ann., 6 to 9.70&10@70&10&5%
Brt. and Ann., 10 to 18.70½@72½&10%
Brt. and Ann., 19 to 26.75&10@75&10%
Brt. and Ann., 27 to 36.....
.75&10@75&10&5%
Cop'd and Galv., 6 to 9.....70@70&5%
Cop'd and Galv., 10 to 18.....
70&5@70&10%
Cop'd and Galv., 19 to 26.....
75@75&5%
Cop'd and Galv., 27 to 36.....
75&5@75&10%
Tinned, 6 to 14.....75@75&5%
Tinned, 15 to 18.....70&5@70&10%
Tinned, 19 to 26.....70@70&5%
Tinned, 27 to 36.....65&10@70%
Annealed Wire on Spools..70&5@70
&10%
Brass and Copper Wire on Spools..
60&5@60&10%
Brass, list Feb. 26, '96.....25%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to £, 40%
Wire Clothes Line, see *Lines.*
Wire Picture Cord, see *Cord.*

Bright Wire Goods—

List April 1, 1901.....85&10%

Wire Cloth and Netting—

Galvanized Wire Netting...35@35&5%
Painted Screen Cloth per 100 ft.....
$1.00@1.10

Light Hardware Grade:
2-8 Mesh, Plain (8c. list) sq. ft...
1¼c
2-8 Mesh, Galv. (8c. list) sq. ft....
2½c

Wire Barb—See *Trade Report.*

Wire, Rope—See *Rope, Wire.*

Wrenches—

Agricultural.....70&10@75&5%
Case lots.....75&10%
Acme .....60&10%
Alligator.....70%
Baxter's S.....60&10%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....35&5%
Adjustable S Pipe.....40%
Brigg's Pattern.....30&10%
Combination Black.....40&5%
Combination Bright.....40%
Cylinder or Gas Pipe.....50%
Extra Heavy.....40%
Merrick's Pattern.....50%
No. 3 Pipe, Bright.....55%
Bindley Automatic.....30%
Boardman's.....33⅓%
Coes' Genuine.....40&10&5&5%
Coes' "Mechanics'".....40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle.....60&10%
Gem Pocket 30%
Hercules.....70%
Knife Handle, Machinists' (W. & B.):
Case lots.....50&10%
Less than case lots.....50&5%
Improved Pipe (W. & B.).....40%
Solid Handles, P. S. & W.....50&10%
Triumph.....60&10%

Wrought Goods—

Staples, Hooks, &c., list March 27 '99.....85&10@85&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed.60&5%
Covert Saddlery Works, Neck Yoke Centers.....70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers & Freighters', list net

Zinc—

Sheet.....lb 6¼@6¾

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.

Lead, Foreign white, in Oil.... 7¼@ 9¾
Lead, American White, in Oil:
Lots of 500 ℔ or over..... @ 6¼
Lots less than 500 ℔..... @ 7
Lead, White, in oil, 25 ℔ tin pails, add to keg price..... @ ⅜
Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... @ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.. @ 1¾
Lead White, Dry in bbls..... 6¼@ 6¾
Lead, American, Terms: On lots of 500 lbs. and over, 60 days, or 2% for cash if paid in 15 days from date of invoice.
Zinc, American, dry.....℔ 4½@ 4¾
Zinc, Paris, Red Seal, dry..... @ 8½
Zinc, Paris, Green Seal, dry..... @ 9½
Zinc, Antwerp Red Seal, dry.... @ 6½
Zinc, Antwerp, Green Seal, dry .. @ 7½
Zinc, V. M. French, in Poppy Oil, Green Seal:
Lots of 1 ton and over.....12 @12¼
Lots of less than 1 ton.....12¼@12¾
Zinc, V. M French, in Poppy Oil, Red Seal:
Lots of 1 ton and over.....10¾@11¼
Lots of less than 1 ton.....11 @11¾
DISCOUNTS.—V. M. French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors.

Black, Carbon.....℔ 8 @20
Black, Drop, Amer..... 4 @ 7
Black, Drop, Eng..... 7 @11
Black, Ivory..... 12 @21
Lamp, Com..... 4½@ 6
Blue, Celestial.....℔ 4 @ 6
Blue, Chinese.....30 @35
Blue, Prussian.....28 @34
Blue, Ultramarine..... 4 @20
Brown, Spanish..... ⅛@ 1
Brown, Vandyke, Amer..... 1¾@ 2½
Brown, Vandyke, Foreign..... 2½@ 3½
Carmine, No. 40.....℔ $2.05@2.75
Green, Chrome, ordinary..... 5 @ 6½
Green, Chrome, pure.....16 @29
Lead, Red, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over..... @ 6
Lots less than 500 ℔..... @ 6½
Litharge, bbls. ½ bbls. and kegs:
Lots 500 ℔ or over..... @ 6
Lots less than 500 ℔..... @ 6½
Ocher, French Washed.....$1.35@2.50
Ocher, Dutch Washed..... 4½@ 5
Ocher, American.....℔ ton $10.00@15.00
Orange Mineral, English..℔ ℔ 8½@11¼
Orange Mineral, French.....11 3-16@11½
Orange Mineral, German..... 8½@ 9½
Orange Mineral, American .... 8 @ 8½
Red, Indian, English..... 4½@ 8½
Red, Indian, American ..... 3 @ 8½
Red, Turkey, English..... 4 @ 6
Red, Tuscan, English..... 7 @10
Red, Venetian, Amer..℔ 100 ℔. 80@1.75
Red Venetian, English.℔ ℔.....1.80@3.00
Sienna, Italian, Burnt and Powdered.....℔ ℔ 3½@ 7½
Sienna, Ital., Raw, Powd..... 3½@ 7½
Sienna, American, Raw..... 1½@ 2
Sienna, American, Burnt and Powdered.....℔ ℔ 1½@ 2
Talc, French.....℔ 100 ℔ $1.25@1.50
Talc, American..... 90 @1.10
Terra Alba, French, ℔ 100 ℔ . 95 @1.00
Terra Alba, English..... 95 @1.00
Terra Alba, American No. 1.....65 @85
Terra Alba, American No. 2....45 @50
Umber, Turkey, Bnt. & Pow.℔ ℔ 2½@ 3½
Umber, Turkey, Raw & Powd. 2½@ 3½
Umber, Bnt. Amer..... 1½@ 2
Umber, Raw, Amer..... 1½@ 2
Yellow, Chrome.....10½@25
Vermilion, American Lead..... 10 @40
Vermilion, Quicksilver, bulk.... @72
Vermilion, Quicksilver, bags.... @73
Vermilion, English, Import... 80 @95
Vermilion, Chinese.....$1.05@1.20

Colors in Oil.

Black, Lampblack..... 19 @14
Blue, Chinese..... 36 @40
Blue, Prussian..... 32 @36
Blue, Ultramarine..... 13 @16
Brown, Vandyke..... 9½@13
Green, Chrome..... 10 @13
Green, Paris..... @24
Sienna, Raw..... 10 @13
Sienna, Burnt..... 10 @13
Umber, Raw..... 9½@13
Umber, Burnt..... 9½@13

Miscellaneous.

Barytes, Foreign, ℔ ton....$19.00@21.00
Barytes, Amer. floated..... 19.00@20.00
Barytes, Crude, No. 1..... 9.00@10.00
Chalk, in bulk.....℔ ton 2.50@ 3.00
Chalk, in bbls.....℔ 100 ℔ ..@ 35
China Clay, English..℔ ton 13.00@17.50
Cobalt, Oxide.....℔ 100 ℔ 2.30@ 2.50
Whiting, Common.℔ 100 ℔. .40@ .60
Whiting, Gilders..... .45½@ .65
Whiting, extra Gilders'..... .55@ .65

Putty.

In bulk.....$1.60
In bladders..... 2.25
In cans, 12 ℔ to 25 ℔..... 3.25
In cans, 1 ℔ to 5 ℔..... 3.25

Spirits Turpentine.

In Southern bbls.....35½@36 ¢
In machine bbls.....36 @36½¢

Glue.

Low Grade.....℔ ℔ 9 @12
Cabinet.....11½@16
Medium White.....14½@16¼
Extra White.....18 @23
French.....12 @40
Irish.....13½@16

Animal, Fish and Vegetable Oils.

Linseed, City, raw.....℔ gal. 61@62
Linseed, City, boiled..... @64
Linseed, State and West'n, raw 59 @61
Linseed, raw Calcutta seed.... @
Lard, Prime..... @1.15
Lard, Extra No. 1..... @ .95
Lard, No. 1..... @ .84
Cotton-seed, Crude..... @ .28
Cotton-seed, Summer Yellow, prime..... @ .30
Cotton-seed Summer Yellow, off grades..... @ .34½
Sperm, Crude..... @
Sperm, Natural Spring..... @
Sperm, Bleached Spring..... @
Sperm, Natural Winter..... @ .61
Sperm, Bleached Winter..... @ .66
Whale, Crude..... @
Whale, Natural Winter..... @ .44
Whale, Bleached Winter..... @ .47
Menhaden, Crude, Sound..... @ .28
Menhaden, Light Strained..... @ .33
Menhaden, Bleached Winter...@ .38
Menhaden, Ex Bleached Winter @ .38
Tallow, prime..... @ .53
Cocoanut, Ceylon..... @ .6½
Cocoanut, Cochin..... @ .7½
Cod, Domestic..... @ .34
Cod, Newfoundland..... @ .37
Red Elaine..... @ .35
Red Saponified.....℔ ℔ 4½@ 4¾
Olive, Italian, bbls..... @ .67½
Neatsfoot, prime..... @ .54
Palm, prime, Lagos.....℔ ℔ 5½@5¾

Mineral Oils.

Black, 30 gravity, 25@30 cold test.....℔ gal. 5½@ 9½
Black, 29 gravity, 15 cold test. 10½@10¾
Black, summer..... @ .09
Cylinder, light filtered..... @ .17
Cylinder, dark filtered..... @ .16
Paraffine, 903-907 gravity..... @ .12
Paraffine, 903 gravity..... @ .11
Paraffine, 883 gravity..... @ .10
Paraffine, red, No. 1..... @ .13½
In small lots ½¢ advance.

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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CURRENT METAL PRICES.

JUNE 5, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ ₩ ℔; Square, 0.8¢ ₩ ℔

1 to 1⅞ in. round and square ..... 1⅛ to 4 in. x ⅜ to 1 in.	₩ ℔ 1.75@1.85¢
Refined Iron:	
1 to 1⅞ in. round and square ..... 1⅛ to 4 in. x ⅜ to 1 in.	₩ ℔ 1.85@1.95¢
1⅛ to 4 in. x ¼ to 5-16	₩ ℔ 2.00@2.05¢
Rods—⅜ and 11-16 round and square.	₩ ℔ 2.20@2.30¢
Angles:	Cts ₩ ℔
3 in. x ¼ in. and larger	2.10¢
3 to 3½ in. x 3-16 in.	2.10¢
1¼ to 3 in. x ¼ in.	2.20¢
1¼ to 2¾ in. x 5-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.20¢
1 to 1¼ x ¼ in.	2.30¢
⅞ x ¼ in.	2.40¢
⅞ x ¼ in.	2.50¢
⅝ x ¼ in.	3.50¢
⅛ x 3-32 in.	4.00¢
Tees:	
1 in.	2.60¢
1¼ in.	2.40¢
1½ in. and larger	2.30¢
Beams	2.25¢
Channels, 3 in. and larger	2.25¢
Bands—1¼ to 6 x 3-16 to No. 8	₩ ℔ 2.20¢
"Burden's Best" Iron, base price	₩ ℔ 3.15¢
Burden's "H. B & S." Iron, base price	₩ ℔ 2.95¢
"Ulster"	₩ ℔ 3.60¢
Norway Bars	3.75@4.25¢
Norway Shapes	4.00@4.50¢

Merchant Steel from Store—

	per ℔
Bessemer Machinery	1.90 to 1.95¢
Toe Calk, Tire and Sleigh Shoe	2.00@2.50¢
Best Cast Steel, base price in small lots	7½¢
Best Cast Steel Machinery, base price in small lots	6 ¢

Soft Steel Sheets—

¼ inch	2.20¢	No. 14	2.70¢
3-16 inch	2.30¢	No. 16	2.90¢
No. 8	2.30¢	No. 18	3.10¢
No. 10	2.50¢	No. 20	3.40¢
No. 12	2.60¢	No. 22	3.50¢

Sheet Iron from Store.

Black.

	One Pass, C. R. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16	₩ ℔, 3.30	3.35¢
Nos. 18 to 21	₩ ℔, 3.40	3.45¢
Nos. 22 to 24	₩ ℔, 3.50	3.55¢
Nos. 25 and 26	₩ ℔, 3.60	3.65¢
No. 27	₩ ℔, 3.70	3.75¢
No. 28	₩ ℔, 3.80	3.85¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₩ ℔ 10½¢

Patent Planished ..... ₩ ℔ A, 9¾¢; B, 8¾¢, nes.

Galvanized.

	B. B.	
Nos. 10 to 16	₩ ℔, 12¢	
Nos. 17 to 21	₩ ℔, 13¢	
Nos. 22 to 24	₩ ℔, 14¢	
Nos. 25 to 26	₩ ℔, 15¢	60@65% off
No. 27	₩ ℔, 16¢	
No. 28	₩ ℔, 17¢	
No. 29	₩ ℔, 19¢	
No. 30	₩ ℔, 21¢	

36 in. 1¢ ₩ ℔ higher.

Foreign Steel from Store—

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 18 @ 20 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 13 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12 ¢
R. Mushet's "Special"	₩ ℔ 46 ¢
" " Annealed	₩ ℔ 75 ¢
" " "Titanic"	₩ ℔ 19 ¢
Hobson's Choice XX Extra Best	₩ ℔ 35 ¢
Jessop Self Hardening	₩ ℔ 45 ¢
Seamans' "Nelson" Steel	40 ¢
Hobson's "Soho" Special Self-Hardening ..	₩ ℔ 43 ¢

METALS—

Tin—

Duty.—Pigs, Bars and Block. Free.	Per ℔
Banca, Pigs	29¼@29⅝¢
Straits, Pigs	29¼@29⅛¢
Straits in Bars	29¼@30⅛¢

Tin Plates—

American Charcoal Plates.

Calland Grade:	
IC, 14 x 20	$6.75
IX, 14 x 20	8.25
Melyn Grade:	
IC, 14 x 20	6.25
IX, 14 x 20	7.75
Allaway Grade	
IC, 14 x 20	5.50
IX, 14 x 20	6.00

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 100 ℔	$4.85@4.90
IX, 14 x 20	5.95@6.00
IXX 14 x 20	7.20@7.25

American Terne Plates—

IC, 20 x 28	$9.50
IX, 20 x 28	11.25

Tin Boiler Plates, American—

IXX, 14 x 26 ..... 112 sheets	$12.50
IXX, 14 x 28 ..... 112 sheets	13.50
IXX, 14 x 31 ..... 112 sheets	15.00

Copper—

Duty: Pig, Bar and Ingot and Old Copper free Manufactured, 2½¢ ₩ lb.

Ingot—

Lake	17¼@17⅝¢
Ansonia grade Casting	16¾@17¼¢

Sheet and Bolt—

January 19, 1900. Net.

Prices, in cents per pound. Sheet 30 x 60.

Not wider than	Not longer than	And longer than	64 oz. & over, 50 lb. sheet, 30 x 60 and heavier.	32 oz. to 64 oz., 25 to 50 lb.	24 oz. to 32 oz., 18¾ to 25 lb.	16 oz. to 24 oz., 12½ to 18¾ lb.	14 oz. and 15 oz., 11 to 12½ lb.	12 oz. and 13 oz., 9½ to 11 lb.	10 oz. and 11 oz., 7¾ to 9½ lb.	8 oz. and 9 oz., 6¾ to 7¾ lb.	Lighter than 8 oz.
Ins.	Ins.	Ins.									
30	72	.....	21	21	21	21	22	23	24	27	30
30	96	72	21	21	21	21	22	24	27	30	
30	.....	96	21	21	21	21	23	27			
36	72	.....	21	21	21	21	23	25	28	31	
36	96	72	21	21	21	23	23	27	30		
36	120	96	21	21	21	23	24				
36	.....	120	21	21	22	23					
48	72	.....	21	21	21	23	25	28	31		
48	96	72	21	21	22	24	26	29			
48	120	96	21	21	23	25	29				
48	.....	120	21	22	24	27					
60	72	.....	21	22	22	24	27	32			
60	96	72	21	21	23	25	30				
60	120	96	21	22	24	27					
60	.....	120	21	23	25	29					
72	96	.....	21	22	24	29					
72	144	96	21	23	26	31					
72	.....	144	22	24	29						
108	120	.....	22	24	30						
108 wider than 108	144	120	24	25							
	.....	144	26	29							

Rolled Round Copper, ⅜ inch diameter and over, ₩ ℔ 21¢.

Circles, Segments and Pattern Sheets, 3¢ ₩ ℔ advance over price of sheet Copper required to cut them from.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.

All Polished Copper, 20 in. wide and under, 1¢ ₩ ℔ advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 in. wide, 2¢ ₩ ℔ advance over the price for Cold Rolled Copper.

Planished Copper—

1¢ ₩ ℔ more than Polished Copper.

Copper Bottoms, Pits and Flats—

14 oz. to square foot and heavier, ₩ ℔	23¢
12 oz. and up to 14 oz. to square foot, ₩ ℔	26¢
10 oz. and up to 12 oz., ₩ ℔	24¢
Lighter than 10 oz., ₩ ℔	31¢

Circles less than 8 in. diameter, 2¢ ₩ ℔ additional.

Circles over 13 in. diameter are not classed as Copper Bottoms.

Copper Wire—

Hard and Soft Drawn—B. & S. Gauge.

Last March 2, 1900.

Nos.	0000 to 8	9 and 10		11 and 12
	Base	¼¢		¾¢ ₩ ℔ adv.
Nos.	13	14	15	16
	¼¢	⅝¢	1¢	1¼¢ ₩ ℔ adv.
Nos.	17	18	19	20
	1¾¢	2¢	2¼¢	2¾¢ ₩ ℔ adv.

Seamless Brass Tubes—

Standard always Stubs' gauge, unless otherwise ordered.

Feb. 6, 1899. Net. Outside Diameter.

Stubs' W. G.	B. & S. W. G.	¼	5-16	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½
4-11	3- 9	.....	.....	.....	.....	33	31	30	29	28	27	25	24
12	10	.....	.....	37	35	33	31	30	29	28	27	25	24
13	11	.....	.....	37	35	33	31	30	29	28	27	25	24
14	12	.....	41	37	35	33	31	30	29	28	27	25	24
15	13	.....	42	38	36	33	32	31	30	30	28	26	25
16	14	.....	43	39	37	34	33	32	31	30	29	26	25
17	15	.....	44	40	38	35	34	33	32	31	30	27	26
18	16	51	45	42	39	36	35	34	33	32	31	28	27
19	17	52	47	43	40	37	36	35	34	33	32	30	28
20	18-19	54	49	44	41	39	38	37	36	35	34	32	31
21	20	56	51	46	43	41	40	39	38	37	36	35	34
22	21	71	56	48	44	42	41	40	39	38	37	37	36
23	22	76	61	50	46	44	43	42	41	40	39	39	39
24	23	81	66	53	48	46	45	44	43	41	40	40	41
25	24	86	71	56	51	49	47	46	45	43	43	44	45

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
28	22	20	27	21	21	21	21	21	21	21	23	23	25	27	28¢ ₩ ℔

Copper, Bronze or Gilding Tubes, 3¢ ₩ ℔ additional

Brazed Brass Tubing.

(To No. 19, inclusive.) Feb. 26 1900

Brown & Sharpe's gauge standard.

	Per ℔.
Plain Round Tube, ⅛ in. up to 2 in.	$0.35
" " ¼ " ¾ "	.36
" " ¼ " 1 "	.38
" " ¼ " 1½ "	.41
" " 5-16 " 1½ "	.48
" " ⅜ " 5-16 "	.63
" " 8-16 " ¼ "	1.00
" " ½ " 3-16 "	1.50
Smaller than ¼ inch	Special
3 inch and larger	.40
Over 3 inch to 3½ inch, inclusive	.45
Over 3½ inch	.50

Bronze and Copper, advance on Brass List, 3 cents.

Discount from list 5 ..... 35%

Roll and Sheet Brass—

(*Brown & Sharpe Standard Gauge.*)

Common High Brass Wider than and including	in. 2 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24	in. 24 26
To No. 20 inclusive.	.22	.23	.25	.27	.29	.31	.33	.36
Nos. 21 22, 23 and 24	.22	.24	.26	.28	.30	.32	.34	.37
Nos. 25 and 26	.23	.24½	.27	.29	.31	.33	.35	.38
Nos. 27 and 28	.23	.25	.28	.30	.32	.34	.36	.39

Common High Brass. Wider than and including	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40	in. 40
To No. 20, inclusive ..	.39	.42	.46	.50	.55	.60	.65	*
Nos. 21, 22, 23 and 24.	.40	.43	.47	.51	.56	.61	.68	
Nos. 25 and 26	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.42	.45	.49	.53	.58	.65	.75	

* Special prices not less than 80 cents.

Add ⅛¢ ₩ ℔ additional for each number thinner than Nos. 28 to 38 inclusive. Discount from List..... 20%

Wire in Coils. List February 26, 1896.

Brown & Sharpe's gauge the standard.	Com. high brass.	Low brass.	Gilding bronze and copper
All Nos. to No. 10, inclusive....	$0.23	$0.27	$0.28
Above No. 10 to No. 16.....	.23½	.27½	.28½
No. 17 and No. 18.....	.24	.28	.32
No. 19 and No. 20.....	.25	.29	.33
No. 21	.26	.30	.34
No. 22	.27	.31	.35
No. 23	.28	.32	.36
No. 24	.30	.34	.38
No. 25	.32	.36	.40
No. 26	.35	.39	.43
No. 27	.38	.42	.46
No. 28	.42	.46	.51
No. 29	.45	.49	.54
No. 30	.48	.52	.62
No. 31	.51	.55	.67
No. 32	.55	.59	.73
No. 33	.59	.63	.82
No. 34	.64	.68	.95
No. 35	.70	.74	1.30
No. 36	.76	.80	1.50
No. 37	1.00	1.04	1.70
No. 38	1.30	1.34	2.00
No. 39	2.00	2.00	3.25
No. 40	2.60	2.60	5.75

Discount, Brass Wire, 20%; Copper Wire, Net. List November 16, 98.

Spring Wire, 2¢ ₩ ℔ advance.

Tobin Bronze—

Straight, but not turned, Rods, ⅝ to 3 in. diameter, ₩ ℔, net ..... 20¢

Finished Piston Rods, ⅝ to 2½ in. diameter, ₩ ℔ net. 21¢

Other sizes and extreme lengths, special prices.

Spelter—

Duty: In Blocks or Pigs, 1¢ ₩ ℔

Western Spelter ..... 4.45@4½¢

Zinc.

Duty: Sheet, 2¢ ₩ ℔.

600 ℔ casks ..... 6¾¢ | Per ℔ ..... 7¼¢

Lead.

Duty: Pigs and Bars and Old, 2½¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.

American Pig	4.60@4.62½¢
Bar	5¼@5½¢
Pipe	6¢
Tin Lined Pipe	12½¢ ..... 20% off
Block Tin Pipe	40 ¢ ..... 20% off
Sheet Lead, full rolls	7¢ ..... 20% off
Sheet Lead, cut	7½¢ ..... 20% off

Old Lead in exchange, 4½¢ ₩ ℔.

Solder.

½ & ¼, guaranteed ..... 18½@18¾¢

No. 1 ..... 14¾@17 ¢

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ¾¢ ₩ lb.

Cookson ..... ₩ ℔ 10¾@11¢

Hallett's ..... ₩ ℔ 9 @9½¢

U. S. ..... ₩ ℔ 9 @9½¢

Aluminum—

Duty: Crude, 8¢ ₩ ℔. Plates, Sheets, Bars and Rods, 13¢ ₩ ℔.

No. 1 Aluminum (guaranteed over 99% pure), in ingot for remelting:

Small lots	₩ ℔ 37¢
100-℔ lots	₩ ℔ 35¢

No. 2 Aluminum (guaranteed to be over 90% pure), in ingots for remelting:

Small lots	₩ ℔ 34¢
100-℔ lots	₩ ℔ 33¢

Aluminum Sheet, B. & S. gauge. 50 ℔ or more

Wider than	6-in.	14-in.	24-in.
And including	14-in.	24-in.	30-in.
	₩ ℔.	₩ ℔.	₩ ℔
Nos. 13 to 19	$0.42	$0.44	$0.47
No. 20	.44	.46	.49
Nos. 21 to 23	.46	.48	.51
No. 24	.46	.50	.53
No. 25	.47	.51	.54
No. 26	.47	.54	.59
No. 27	.48	.57	.62
No. 28	.48	.57	.64
No. 29	.49	.60	.69
No. 30	.50	.64	.77

Note.—Lots of less than 50 ℔ 5¢ ₩ ℔ extra.

Aluminum Wire, B. & S. Gauge.

Larger than No. 9	₩ ℔ 40¢	No. 15	₩ ℔ 43¢
No. 9 to No. 10 ..	₩ ℔ 40½¢	No. 17	₩ ℔ 50¢
No. 11	₩ ℔ 41 ¢	No. 18	₩ ℔ 55¢
No. 12	₩ ℔ 41½¢	No. 19	₩ ℔ 60¢
No. 13	₩ ℔ 42 ¢	No. 20	₩ ℔ 65¢
No. 14	₩ ℔ 43½¢	No. 21	₩ ℔ 85¢

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Heavy Copper	₩ ℔ 15 ¢
Light and Tinned Copper	₩ ℔ 13½¢
Heavy Brass	₩ ℔ 10 ¢
Light Brass	₩ ℔ 8 ¢
Lead	₩ ℔ 4 ¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 2½¢
No. 1 Pewter	₩ ℔ 18½¢
No. 2 Pewter	₩ ℔ 9 ¢
Tin Plate Scrap	₩ ton $6.00
Wrought Scrap Iron	₩ gross ton $10.50 @ 11.00
Heavy Cast Scrap	₩ gross ton $10.00@ 10.50
Stove Plate Scrap	₩ gross ton $7.50@ 8.00
Burnt Iron	₩ gross ton $5.00@ 5.50